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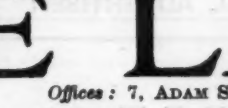

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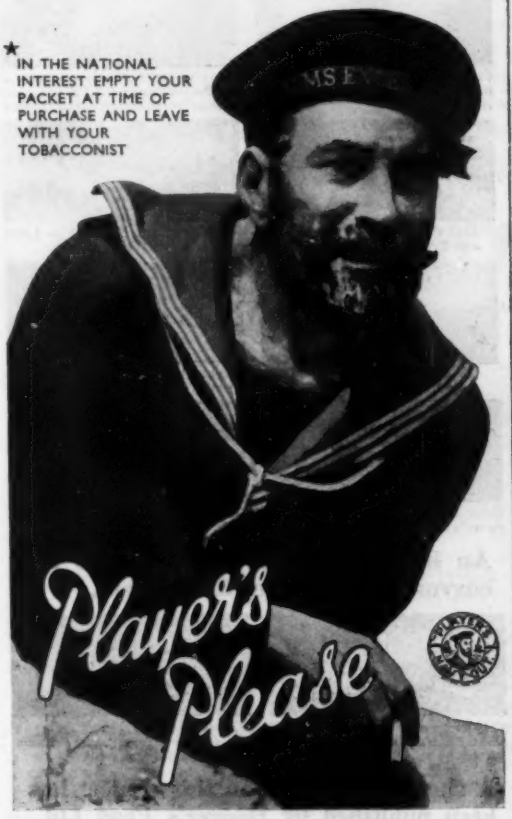

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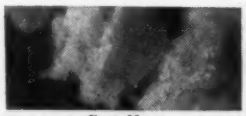

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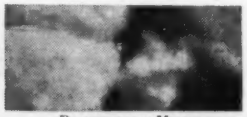

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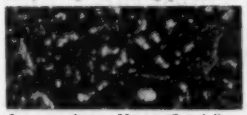
BOILED MILK—*The milk was momentarily brought to boiling point.*

DILUTED MILK — 1 *part milk and* 1 *part water*



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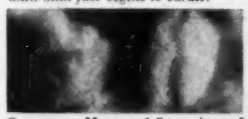
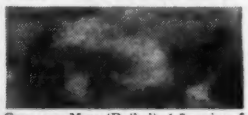
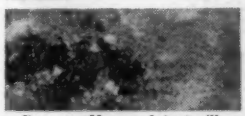


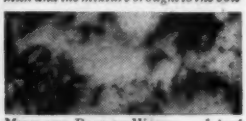
CITRATED MILK — 1.5 *grains of sodium citrate added to* 1 *fl. oz. of raw milk.*



CITRATED MILK (Boiled)—1.5 *grains of sodium citrate added to* 1 *fl. oz. of raw milk and the mixture brought to the boil*



DILUTED MILK — 1 *part milk and* 2 *parts water.*

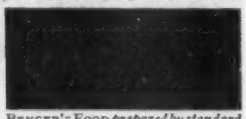


MILK AND BARLEY WATER — 1 *part milk to* 1 *part Barley Water.*

MILK AND CREAM — 1 *part milk to* 1 *part cream.*

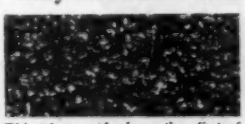
BENGER'S FOOD *prepared by standard formula and self-digested for* 5 *mins.*

BENGER'S FOOD *prepared by standard formula and self-digested for* 15 *mins.*

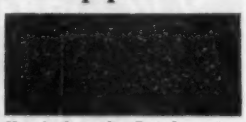


BENGER'S FOOD *prepared by standard formula and self-digested for* 30 *mins.*

An infant's gastric juice contains the enzyme rennin rather than pepsin.



This photograph shows the effect of rennet on Human Milk adjusted to pH 4.6.



Here is shown the effect of rennet on Benger's Food prepared by Formula 1 *and adjusted to pH* 4.6.

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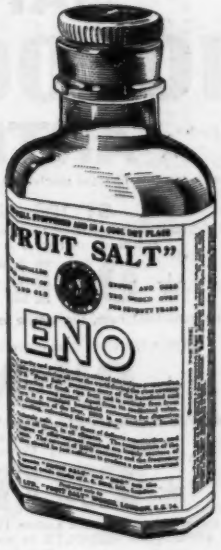

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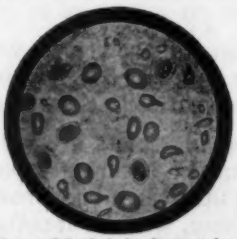
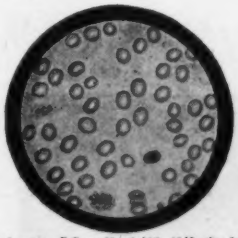


Blood film from case R.C. at beginning of treatment, Jan. 30th, 1940. R.B.C. 1.44, Hb. 40, Retic. 0.4, C.I. 1.35, C.V. 91, M.C.V. 138.4



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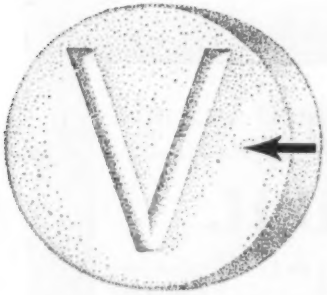

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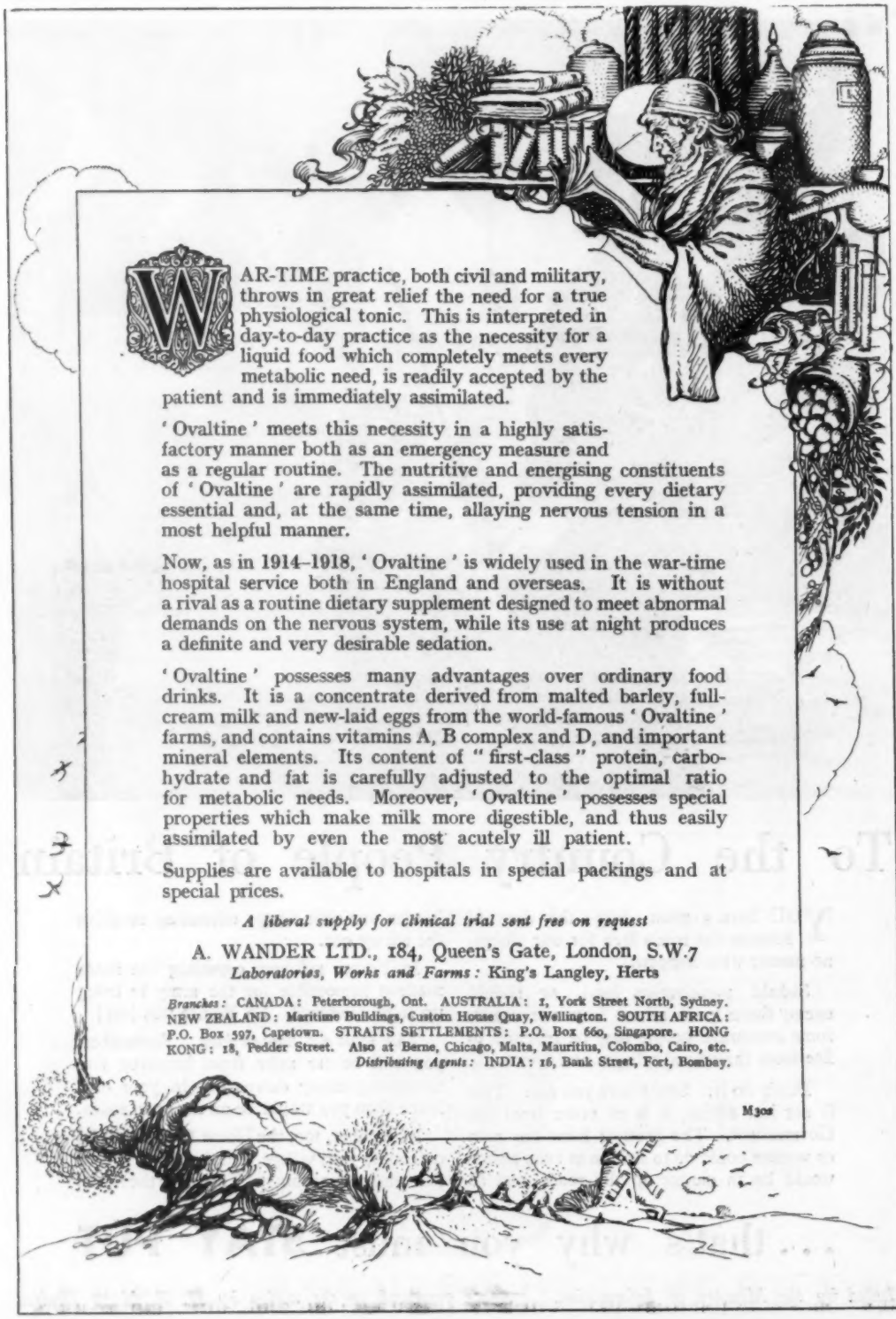

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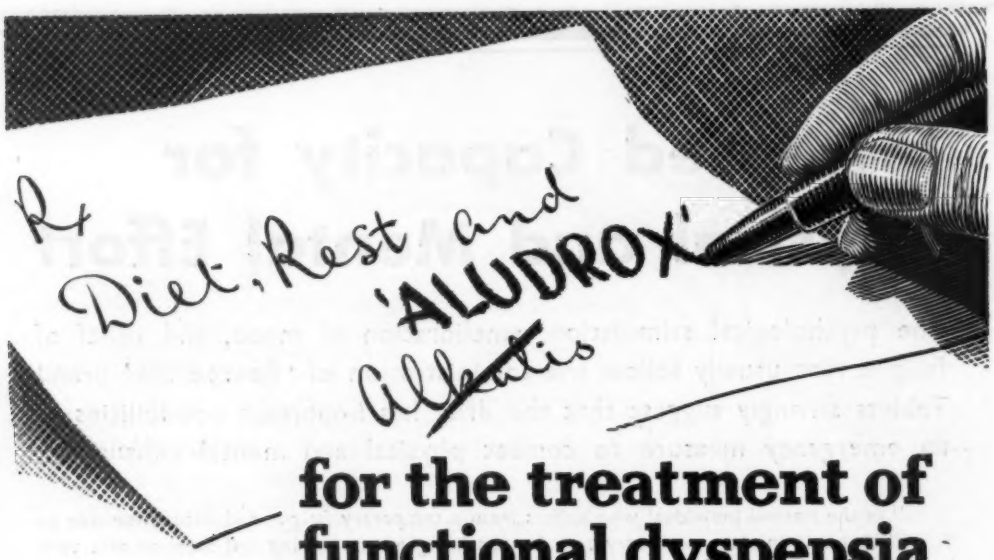

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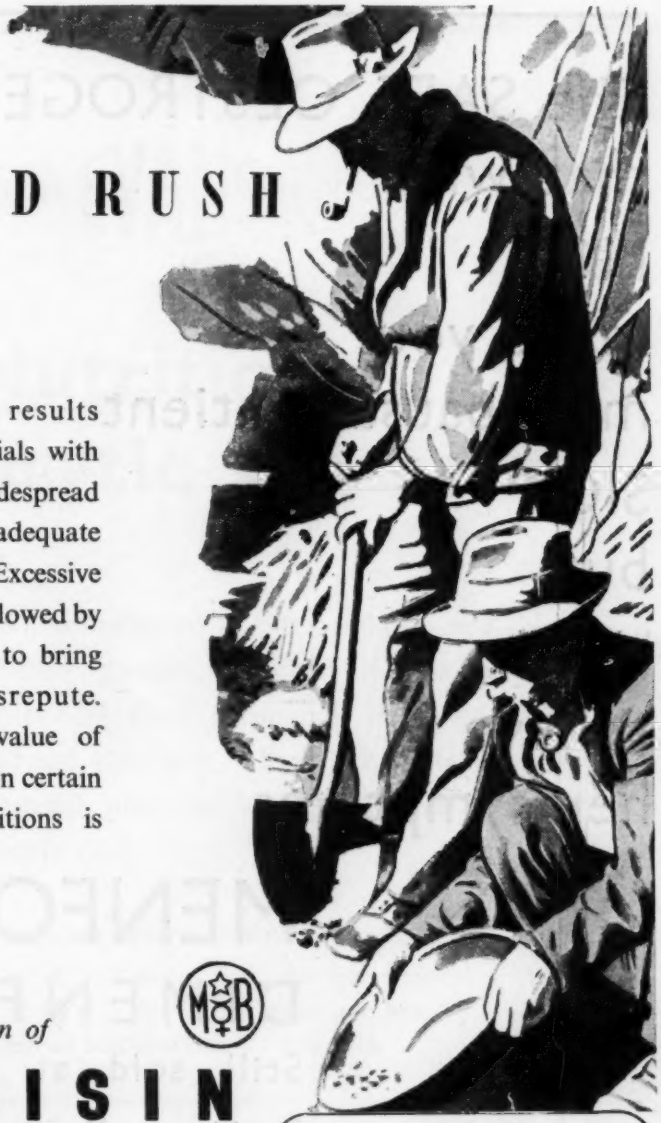

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ORIGINAL ARTICLES

CHRONIC JEJUNO-ILEAL INSUFFICIENCY

PATHOGENESIS OF CŒLIAC DISEASE, TROPICAL SPRUE, AND OTHER CONDITIONS

BY T. IZOD BENNETT, M.D. Lond., F.R.C.P.
PHYSICIAN WITH CHARGE OF OUTPATIENTS AT THE MIDDLESEX HOSPITAL; AND
C. HARDWICK, M.D. Camb., M.R.C.P.
MEDICAL REGISTRAR AT THE HOSPITAL

PROTECTED above and below by the pylorus and the ileocæcal sphincter, the jejunum and ileum are shut off from many of the adverse influences which cause disease in more exposed parts of the body; the movements and secretion of the stomach are a further safeguard to the small intestine. Consequently chronic ulceration and malignant disease are rare below the duodenum. In view of these facts it is surprising that no-one has yet described what happens when there is either partial or total failure of the jejunum and ileum to fulfil their normal functions.

THE SYNDROME

The last twenty years have seen the increasing recognition, in many countries, of a clinical syndrome of steatorrhœa, tetany, and macrocytic anæmia. The names of Gee, Herter, Heubner, and Thaysen have been attached to it; cœliac disease and tropical sprue fall within its definition; and in Germany and Scandinavia there has been a tendency to class together as non-tropical sprue all such cases not coming from the tropics. The syndrome is also found in some cases of malignant or of cicatrising disease of the small intestine, in some cases of gastrocolic fistula, and in some cases of tabes mesenterica. Rickets and deformed bones are common when the syndrome affects children. The anæmia is at times hypochromic and in a few cases erythroblastic; stomatitis and sore tongue are common; and skin lesions, including some closely resembling those of pellagra, have often been described. The fatty diarrhœa is notable for the fact that the fat is fully split, and the stools may be bulky and pale but not conspicuously frequent. In other cases the stools are very frequent and gassy; megacolon, perhaps compensatory, is pronounced in some cases. When the syndrome begins in childhood and proceeds during adolescence and adult life, there is stunting of growth, often accompanied by infantilism (fig. 1). When it begins during adult life it is usually accompanied by sterility; but should pregnancy occur, there is often an acute exacerbation of symptoms. Blood calcium and blood phosphorus are often low, blood nitrogen is sometimes low, and more often the glucose-tolerance curve is flattened. Achlorhydria is common but by no means constant.

FIG. 1—Jejuno-ileal insufficiency. Chronic cœliac disease in a female aged 22, showing dwarfism, infantilism, rickets, non-calcification of bone, subacute tetany, fatty stools, and skin rashes. The patient's stature is under 4 ft.

CŒLIAC DISEASE AND TROPICAL SPRUE

In spite of the attempts often made by continental writers to recognise in this syndrome a single entity, it seems clear that two relatively common diseases in no way related to one another, cœliac disease and tropical sprue, are responsible for the vast majority of examples. Great Britain is the only place where both diseases are seen at all frequently. The following points are important in differentiating between these two conditions:

Age of incidence.—Cœliac disease (fig. 2) essentially affects little children; its recognition is sometimes delayed until adolescence, the infantile history of the case being one of chronic diarrhœa, marasmus, and rickets. Tropical sprue is essentially a disease of adult life, practically never developing in childhood; Fairley records a solitary case at the age of fourteen.

Gastro-intestinal phenomena.—Cœliac disease produces meteorism, but in its later stages the stools tend to be pale and bulky rather than frequent; stomatitis and sore tongue are rare; megacolon is common in the older patients. In sprue the fæces tend to be more fluid, and the diarrhœa responds more rapidly and completely to treatment. Sore tongue and stomatitis are practically the rule; megacolon seldom if ever develops.

Calcium disturbances.—Tetany, either larval or acute, is common in both conditions, but rickets and deformed bones are found in cœliac disease alone.

Anæmia.—The anæmia of cœliac disease is usually hypochromic, except when it is a fulminating condition, which, however, is not often found before adolescence or after survival to adult life. In tropical sprue macrocytic anæmia is very common and seldom fatal if treatment is adequate.

Prognosis.—Established cœliac disease is fatal in 40% of patients during the first two years, and of those who survive the early stages not more than 25% reach the third decade (Hardwick 1939). Tropical sprue, properly treated, gives an extremely good prognosis, so much so that many authorities regard it as invariably curable.

DELAYED CŒLIAC DISEASE AND DELAYED SPRUE

If it is true that cœliac disease and tropical sprue constitute the vast majority of cases included in this syndrome, what is the explanation of that mass of cases described in the continental literature under the name "non-tropical sprue"? Many such cases are probably examples of cœliac disease which have escaped recognition during infancy. Bennett, Hunter, and Vaughan (1932) found, in fifteen cases in adults, that in only one of them did the history begin later than childhood. Unless someone who knew the patient as a little child can be found as a witness, it is usually impossible to date the onset in these cases of chronic steatorrhœa. How many of us can give an accurate medical history of our first ten years? Again and again it has been discovered, when finally the mother has been interviewed, that a patient said to have been normal up to the age of sixteen or twenty really had diarrhœa during his early years. There appear to be rare exceptions to this rule, such as a young woman described by Bennett (1934).

This patient came under observation at

FIG. 2—A classical example of infantile cœliac disease with protuberant abdomen and wasted buttocks. The patient died in spite of prolonged and most careful treatment. (By courtesy of Dr. Alan Moncrieff.)

twenty-one because of severe repeated attacks of tetany. At fourteen she had first had abdominal distension, with bulky pale stools, but her mother said that she had been a healthy breast-fed baby and, except for whooping-cough, measles, and chicken-pox, had never been away from school before puberty was past. When she came under observation she had the classical stools, with low blood calcium. Her tetany and mild hypochromic anæmia were relieved by proper treatment, but a year later she died, in the country, of a fulminating pernicious anæmia.

Such a case should be looked on as one of cœliac disease with delayed onset. Equally important, because of their tendency to create confusion, are the cases of tropical sprue with delayed onset, of which the following is an example:

A female, aged fifty-five, was first seen in 1931 because of soreness of the mouth, dysphagia, and increasing weakness, which had been present for six months. She had come to England nine years previously after passing seventeen years in Hong-Kong, where she had borne two healthy children, without complications. In Hong-Kong she had had two trivial attacks of dengue. In the nine years after her return to England she had been perfectly well.

When first seen she was suspected of having the Plummer-Vinson syndrome. A partial blood-count revealed a reduction of the red cells to 3·19 million, with hæmoglobin 50%. A fractional test-meal showed free hydrochloric acid. The patient went away on holiday and was not seen again for four months, during which period she became much worse and developed severe diarrhœa. She was then admitted to the Middlesex Hospital, where it was found that her diarrhœa was fatty, observations over two months showing that the total fats in the stools averaged 50·6%, with 32·2% of unsaponified fat, 5·9% of neutral fat, 27·3% of free fatty acid, and 17·4% of combined fatty acids. Radiography of the stomach revealed nothing abnormal. Wassermann reaction negative; blood analysis: urea 23, cholesterol 149, calcium 7·1–9·2. Glucose-tolerance curve: 80, 75, 80, 85, 85. Van den Bergh reaction indirect positive; quantitative 3 units. Radiogram of the long bones normal. The density of the cortex of the bones was perhaps slightly less than the average normal. Hæmatological examination revealed reduction of the red cells below 3 million, with hæmoglobin approximately 50% and colour-index sometimes exceeding unity; the mean diameter of the cells was 8·0 μ, with megalocytosis, anisocytosis, and poikilocytosis. Table I gives the figures of the patient's weight, hæmoglobin, red cells, and blood calcium at various dates.

TABLE I—SELECTED OBSERVATIONS FROM A CASE OF DELAYED SPRUE

Date	Weight	Hæmoglobin	Red blood-cells (million)	Blood calcium (mg. per 100 c.cm.)
2 xi. 31	5 st. 5½ lb.	50%	2·41	..
2 xii. 31	5 ,, 2½ ,,	55%	2·79	..
27 i. 32	,, ,,	85%	3·40	7·1
13 ii. 32	5 ,, 2 ,,	82%	3·50	5·6*
23 ii. 32	5 ,, 2½ ,,	,,	4·10	7·1
29 iv. 32	6 ,, 6½ ,,	,,	3·10	9·2
29 vii. 32	7 ,, 2 ,,	98%	4·50	..
19 v. 33	7 ,, 9½ ,,	75%	3·50	..
25 viii. 33	..	88%	4·40	..
18 v. 34	..	100%	,,	..
27 iii. 36	7 st. 1 lb.	68%	3·50	..
30 vii. 37	7 ,, 5 ,,	82%	3·60	..
24 ix. 37	7 ,, 7½ ,,	95%	4·44	..

* Tetany.

While she was in the wards, two small blood-transfusions were given, the second of which precipitated or coincided with an attack of acute tetany, which was relieved by calcium injections. As soon as sprue was diagnosed, treatment with liver, liver extract, calcium, and a low-fat diet was instituted on orthodox lines, and the patient made a rapid and complete recovery, which has persisted except for two or three minor relapses. She is now very well.

A further example recently under observation was a man, aged fifty-five, who was referred to us by a rhinologist:

He had worked in India for twenty-eight years and, while there, had only had minor illnesses, with no gastro-intestinal disorder. He had been away from the tropics for four years and had become ill about fourteen months before he came under observation. Diminution of appetite, energy, and weight was followed by a complete loss of the senses of taste and smell. On ordinary clinical examination no obvious disease was found except considerable infection in one antrum; this was washed out. The patient's decline in health persisted, and looseness of the bowels and sore mouth developed. The hæmoglobin fell to 45% and the red cells below 2 million; macrocytosis, anisocytosis, and hypochromia were present; the fæces showed 39% of split fat; and the blood calcium was 8·8 mg. per 100 c.cm. Treatment with nicotinic acid, riboflavin, a low-fat diet, and injections of liver extract steadily restored his health to normal. The sore tongue and anosmia disappeared quickly.

Since writing the above we have observed a case in which tropical sprue developed thirty-seven years after the patient had left the tropics.

"NON-TROPICAL SPRUE"

Cases of delayed cœliac disease, cœliac disease diagnosed in adult life, and delayed tropical sprue must naturally confuse the ætiology, even when the disease does not elude diagnosis. A further group of cases, however, appears to be different from those quoted. A classical example of this was submitted to us for investigation by Dr. A. M. Nussey, who had reported the case in 1937 (Nussbrecher and Morton 1937).

A female, aged forty-two, a married woman with three healthy children aged seventeen, eleven, and seven. No serious trouble at confinements, but ten days after the birth of the last child diarrhœa began and continued for two years. She sometimes had fifteen stools daily. During this time she did not go to a doctor, because she was ashamed of the diarrhœa. She then went to the Women's Hospital, Birmingham, where an operation for prolapse was performed, and she remained in hospital for three weeks. During that time the diarrhœa was better, but it returned when she went home. Eighteen months later, the diarrhœa continuing, she consulted her doctor again and returned to the hospital, where a minor operation was performed without relief.

In June, 1936, she went into Selly Oak Hospital under Dr. Nussey and was an inpatient there on eight occasions. During the two years before her admission to the Middlesex Hospital she had had diarrhœa, spasms of hands, feet, legs, stomach, and mouth, and weakness. When she came under our observation in 1938 her abdomen was distended and her tongue "raw." She said that it became sore during acute attacks of spasm. Her colour was good; fingers not clubbed; teeth exceptionally free from caries; Trousseau's and Chvostek's signs positive; tendon reflexes brisk; both ankles swollen, little if any pitting; legs tender to pressure.

A blood-count showed hæmoglobin 110%, red cells 5·3 million, and normochromia. Blood-urea 12 mg. Non-protein nitrogen 20. Blood-sugar 86. Blood calcium 6·7. Phosphates 2·4 mg. per 100 c.cm. Alkali reserve 53 c.cm. CO 2%. Serum proteins: albumin 2·12, globulin 2·36 g. per 100 c.cm. Sodium 328. Potassium 16 mg. per 100 c.cm. Blood agglutinations were negative for typhoid A and B and dysentery.

Fæcal fats amounted to 45%, of which 7·4% was neutral unsplit fat. No tubercle bacilli were found in the fæces. A barium enema showed that the colon was greatly dilated. No ova, cysts, parasites, or abnormal organisms were found.

Previous investigations made by Dr. Nussey had shown constant steatorrhœa with normal splitting, a flat glucose-tolerance curve, achlorhydria, and no decalcification of bones.

The patient had been under treatment for tetany with calcium gluconate, Campolon, and ammonium chloride without relief. On coming under our care she was given 150 mg. daily of nicotinic acid, which brought about remarkable improvement, the tetany vanishing and the tongue becoming less sore.

Two months after discharge from our care she returned to Dr. Nussey in a condition of grave emaciation, with almost continuous tetany. In spite of treatment the blood calcium remained about 6 mg. There was no serious anæmia; the serum proteins were consistently low—about 4 g.—in spite of a rich protein diet. She develped a parotid abscess and died. At a partial autopsy there was no great dilatation of the lacteals and no obvious anatomical lesion.

Such cases are sufficiently rare to warrant the quotation of another example.

A female, aged thirty-four, could remember occasional slight attacks of diarrhœa as a child, but no real illness until the age of twenty-six, when she had lassitude, nausea, a burning sensation in the throat, and sore tongue. She had never been out of England. In 1938 diarrhœa became manifest, and when first seen she was pale and thin. There was no distension of the abdomen, no clubbing of the fingers; the tongue was smooth but not glossy or ulcerated. Macrocytic anæmia was present; hæmoglobin 55, red cells 2½ million. Fæcal fat 53%, split normally. Fractional test-meal showed some reduction of hydrochloric acid; blood calcium 9·5 mg.; sugar tolerance, flat curve; stomach normal on gastroscopy. On injection of liver extract, with full doses of iron and a diet containing low fat and sufficient vitamins, she made good progress and was in good health with a normal blood-count eighteen months later; diarrhœa was fully controlled, but the total fæcal fat remained high. The blood-count was normal. She has placed herself under the care of a foreign doctor, who now assures her that she can never have had either steatorrhœa or severe anæmia.

These two cases may certainly be accepted as examples of a syndrome indistinguishable from tropical sprue and manifesting itself for no discoverable reason during adult life in a non-tropical country. The first is particularly remarkable in that the patient had borne three children with unimpaired health, a fact which completely excludes the possibility that she had ever had cœliac disease. We can find no justification for classing such cases with cœliac disease or for describing them, as has been done by H. Moore et al. (1936) and by E. Mogensen (1937), as Gee-Thaysen disease. Thaysen deserves the fullest credit for his work in emphasising the incidence of these sprue-like cases among adults in temperate zones; but his work is marred by the persistence with which he emphasises the probable identity of these conditions. This situation is not improved by the endeavour of Moore and others to identify the infantile cases with those appearing in later life to the exclusion of the tropical cases, for the cases arising in adult life resemble the tropical cases closely but have only superficial resemblance to the infantile and adolescent ones.

OTHER CAUSES OF THE SYNDROME

The syndrome of steatorrhœa, tetany, and macrocytic anæmia is occasionally found in other circumstances with clearer indications of its pathogenesis. Fairley and Mackie (1937) have described four cases in which the main symptoms and physical findings, together with steatorrhœa, a flat glucose-tolerance curve, decreased serum calcium, and macrocytic anæmia were present, and at the subsequent autopsies lymphoma, lymphadenoma, or lymphosarcoma of the mesenteric glands were recorded. Further, Ryle (1924) had produced evidence of lacteal obstruction from healed tuberculosis of the mesenteric lymph-glands in several patients who presented the clinical picture of cœliac disease during life. But in considering these cases it must never be forgotten that in the vast majority of autopsies on cases of cœliac disease or of tropical sprue the most careful search has failed to reveal mechanical obstruction of this type. Finally, it has long been recognised that in cases of gastrocolic fistula a sprue-like picture may be produced (see below).

TRUE NATURE OF THE SYNDROME

Cheadle (1903) unsuccessfully attempted to explain this syndrome as the result of hepatic deficiency, "acholia." Bramwell (1915) long endeavoured to ascribe it to pancreatic deficiency. But in recent years it has become recognised that the principal pathological process producing the syndrome is defective absorption from the small intestine. Nevertheless we feel that up to now there has been a general failure to recognise that there is present something far more extensive than a mere inability to absorb fat and fat-soluble substances. Many authors have tried to find an alternative explanation, such as an endocrine disturbance; thus, Thaysen (1932), Verzar (1936), and others have not hesitated to suggest that a failure of absorption of the vitamin-B complex so affects the suprarenal secretion that an intestinal asthenia is produced, with resultant steatorrhœa. Emphasis has occasionally been laid on the finding that the excreted fat sometimes exceeds the total amount ingested, regardless of the fact that a similar observation has been made on normal patients placed on appropriate diets.

The clinical picture is in all the cases that presented by chronic jejuno-ileal insufficiency. When the function of an essential organ, such as the pancreas or the kidney, is gravely impaired, we speak of the resultant picture as "pancreatic insufficiency" or "renal insufficiency." It does not matter whether renal failure is due to inflammatory or to ischæmic sclerosis, to the destruction wrought by extensive cystic disease, or to the back-pressure following prostatic or ureteric obstruction; the general picture is the same—cerebral disturbances, anæmia, and gastro-intestinal disturbances, effects of hypocalcæmia, or lowering of the alkali reserve. These constitute the syndrome of renal insufficiency due to gross interference with total renal function.

In sprue, cœliac disease, and the various other conditions resembling these diseases, we see the effects of gross interference with the total function of the small intestine. We see typical carbohydrate dyspepsia, with gassy distension of the bowel, owing to the bacterial hydrolysis of starch following the failure of amylolytic digestion by succus entericus. But we further see far more striking results of the lack of absorption of various components of the diet: the fat, although split, cannot be digested and produces steatorrhœa; the sugar is poorly absorbed and a flat glucose-tolerance curve results; even protein is ill absorbed, with the result that the blood-urea and the serum proteins are often low.

Poor absorption of the salts is conspicuously seen in the case of calcium, and tetany and deficient ossification result; the defective absorption of iron is followed by hypochromic anæmia; and macrocytic anæmia often appears owing to a failure to absorb the anti-pernicious-anæmia factor. Toad-skin and xerophthalmia proclaim the deficiency of vitamin-A. Sore tongue, œdema, cheilosis, defective growth, and appearances of pellagra result from shortage of the vitamin-B complex. Rickets, infantilism, and sterility proclaim deficiencies of vitamins-D and E. Sudden hæmorrhage in some cases suggests deficiency of vitamin K or vitamin P. This formidable list of deficiencies is set out in table II; it is perhaps worthy of comment that evidence of scurvy does not appear ever to present itself.

TABLE II—JEJUNO-ILEAL INSUFFICIENCY

Defective factor	Effects
Secretion of succus entericus	Meteorism and frothy stools
Absorption of—	
Protein	Occasional low values of blood nitrogen and plasma protein.
Fat	Wasting and steatorrhœa.
Carbohydrate	Wasting and flat glucose-tolerance curve.
Calcium	Hypocalcæmia, tetany, and non-calcification of bone.
Iron	Hypochromic anæmia.
Anti-pernicious-anæmia factor	Macrocytic anæmia.
Vitamin A	Occasional xerophthalmia and toad-skin.
Vitamin-B complex	Anæmia, sore tongue, and anosmia.
Vitamin D	Rickets.
Vitamin E	Sterility and infantilism.
Vitamins K and P	Hæmorrhage.

Neither in tropical sprue nor in cœliac disease has the morbid anatomist, even with the microscope, been able to produce convincing evidence to support this conception of chronic jejuno-ileal insufficiency; but, when we reflect that in diabetes mellitus there is still no convincing histology to support our beliefs about its pathology, and that our satisfactory knowledge of the pathology of pernicious anæmia is equally unsupported by any very conclusive anatomical picture, it becomes clear that the filling of this gap is by no means essential. The ultimate proof of the nature of the syndrome under consideration lies in the evidence provided by gastrocolic fistula.

GASTROCOLIC FISTULA

The severe general consequences of gastrocolic fistula are well known. Apart from the sometimes terrible effects of colonic contents regurgitating into the stomach, diarrhœa and loss of weight are usually severe; but

further manifestations may include macrocytic anæmia, sore tongue, wasting, and effects of hypocalcæmia. Fairley and Kilner (1931) and Mindline and Rosenheim (1935) may be quoted among those who have emphasised the resemblance of the picture thus produced to tropical sprue or to idiopathic steatorrhœa. Benker and Hammet (1939) have collected much of the literature on the subject.

Many authorities have emphasised the obvious association between the presence of the short circuit and the development of general manifestations, particularly macrocytic anæmia. Witts (1932) and others have particularly emphasised this point; and Poynton and MacGregor (1930) and Strauss (1934) may be cited among those who have given attention to the importance of the

FIG. 3—Radiogram showing short-circuit between jejunum and colon. This operation caused steatorrhœa, macrocytic anæmia, tetany, and glossitis. Patient was cured by surgical restoration of intestine to normal.

gastro-intestinal tract in conditioning deficiency disease. But in spite of this mass of literature it seems that there is not yet clear recognition of the differing rôles of the stomach and the small intestine in occasioning general disease; still less has the syndrome of jejuno-ileal insufficiency been recognised.

A gastrocolic fistula creates a complex general disturbance owing to the uncertain flux and reflux of the contents of the stomach, colon, and small intestine, particularly since in most cases there is a short-circuit uniting stomach, small intestine, and large intestine. In rare instances the evidence is less complicated and conclusions become irrefutable.

A store keeper, aged forty-six, had been well, save for a trivial dyspepsia, throughout the first forty years of his life. He came under observation in January, 1940. In February, 1935, he had had a sudden attack of abdominal pain, with diarrhœa and vomiting. The abdomen was opened and pus evacuated, without any obvious lesion being discovered. He made an imperfect recovery and a month later had pain and abdominal distension. The abdomen was again opened and a dilated loop of bowel anastomosed with a collapsed loop. He made a good recovery and was very well for four years.

In June, 1939, he began to complain of fatigue. His tongue became very sore, and he lost his sense of taste. He began to lose weight. In September, 1939, the loss of weight was continuing and the mouth very sore; he consulted a dermatologist, who gave him large doses of nicotinic acid, which practically cured the sore mouth. Loss of weight was now accompanied by frequent bulky motions; tingling of the hands and feet followed; and there was occasional vomiting.

He came under our care and we found the following manifestations. Fatty stools, with 56% of total fat, of which 41% was split. Macrocytic anæmia, red cells 3·2 million, hæmoglobin 75%, mean corpuscular diameter 8·4 μ. Chvostek's and Trousseau's signs positive. Blood calcium reduced. Attacks of acute tetany. Fractional test-meal gave normal results. Wassermann reaction negative. Glucose-tolerance test gave a low but not absolutely flat curve. Tongue red and fissured. Radiography of the alimentary canal showed that there was anastomosis of the upper jejunum to the ascending colon (fig. 3).

Tetany was controlled by the administration of calcium. The anæmia was relieved by injections of liver extract and by blood-transfusions. A laparotomy was performed by Mr. R. Vaughan Hudson, who restored the normal continuity of the bowel. The patient has now been well for some months with no special treatment whatever. The previous peritonitis and obstruction had been due to a leaking duodenal ulcer which, at the final operation, was found healed.

This case surely demonstrates as clearly as possible, short of deliberate vivisection, the effects of serious interference with the total function of the small intestine. Chronic jejuno-ileal insufficiency and its major consequences were produced.

SUMMARY

There is a well-recognised syndrome comprising fatty diarrhœa, macrocytic anæmia, tetany, and other manifestations of hypocalcæmia and of deficiencies of various vitamins.

Cœliac disease and tropical sprue are the commonest causes of this syndrome, but it is also encountered in cases which have been described as idiopathic steatorrhœa, Gee's disease, Gee-Herter disease, Herter-Heubner disease, Gee-Thaysen disease, and non-tropical sprue.

It is further encountered in some cases of gastrocolic or of enterocolic fistula of malignant or non-malignant origin and in rare cases where the intestinal lacteals are involved by fibrotic tuberculous lesions or by such processes as lymphoma or lympho-sarcoma.

Although the same syndrome, in its major aspects, is present in all of these conditions, it is usually possible to identify the disease responsible for each case.

Even in the present incomplete state of knowledge it is important to recognise that in every example of this syndrome the clinical picture is due to the same cause—i.e., chronic jejuno-ileal insufficiency, with consequent defects of secretion and absorption.

The final proof of this is provided by cases where the small intestine is deprived of its functions by surgical short-circuiting.

The chemical, pathological, and radiological findings quoted in this paper have been obtained for us in the Courtauld Institute of Biochemistry, the Bland-Sutton Institute of Pathology, and the X-ray department of the Middlesex Hospital. We wish to express our indebtedness to all our colleagues in these departments. We also wish to thank our past and present colleagues, Mr. R. Vaughan Hudson, and Drs. A. M. Nussey and A. Morton Gill for invaluable assistance and permission to refer to their work.

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POTASSIUM AND PHOSPHATE CONTENT OF PLASMA FROM STORED BLOOD

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In a previous paper (1940) we showed, in agreement with other workers, that after withdrawal of blood from the body there is an immediate and rapid rise in the plasma potassium and a less rapid but definite increase in the plasma inorganic phosphate. These observations are important in view of the increased use of plasma for transfusions, for some of the reported reactions may have been due to chemical changes which have taken place before the plasma was separated from the blood. It has been suggested that fourteen days may be allowed to elapse before the separation of the plasma, the whole blood being available during this period for transfusions and the plasma only being separated when the whole blood becomes of doubtful value. We do not entirely subscribe to this view.

We have studied the composition of the plasma separated from blood after its storage for various periods; our earlier work, using heparin and sodium citrate as anticoagulants, has been extended and the effects of dilution with sodium-chloride solution, with and without glucose or dextrin, has been investigated again with particular reference to potassium and phosphate.

EXPERIMENTAL

Forty-eight samples of blood in amounts from 400 to 600 c.cm. were collected from donors under sterile conditions into quart milk bottles. Just before drawing the blood the following sterile solutions of the anticoagulant and diluting fluids were sucked into the appropriate bottles:

Bottles 1–4: sodium citrate (25 c.cm. of 8·72% solution).

Bottles 5–8: heparin (9 c.cm. containing 45 mg. heparin, equivalent to 18,000 units).

Bottles 9–12: 25 c.cm. of a solution containing sodium citrate (8·72%) and glucose (24%).

Bottles 13–36: 100 c.cm. of sodium-citrate solution (2·1%) and 100 c.cm. of sodium-chloride solution (1·7%). In addition bottles 18–24, 25–30, and 31–36 received in the sodium-chloride solutions 6 g. glucose, 18 g. glucose and 12 g. dextrin respectively.

Bottles 37–48: 70 c.cm. of a solution containing sodium citrate (2·5%) and sodium chloride (0·85%); 10 c.cm. of 50% glucose solution.

TABLE I—CONCENTRATIONS OF ANTICOAGULANTS AND PRESERVATIVES

Sample Nos.	Vol. of blood (c.cm.)	Vol. of preservative (c.cm.)	Final concentrations (g. per 100 c.cm. diluted blood)				
			Sod. cit.	Sod. chlor.	Glucose	Dextrin	Heparin
1–4	600	25	0·35	..	..	..	..
5–8	600	9	..	..	..	..	0·0075
9–12	600	25	0·35	..	1	..	..
13–18	400	200	0·35	0·28	..	..	..
19–24	400	200	0·35	0·28	1	..	..
25–30	400	200	0·35	0·28	3	..	..
31–36	400	200	0·35	0·28	..	2	..
37–42	420	80	0·35	0·12	1	..	..
43–48	420	80	0·35	0·12	1	..	..

The final concentrations of the added constituents in the diluted blood samples are given in table I. The anticoagulant solution used in bottles 13–36 corresponds to that recommended by the Medical Research Council (Harington and Miles 1939) except for the addition of glucose.

Separation of plasma.—The bottles containing the blood were treated as follows:

Bottles 1–12. The blood in each of the bottles was divided into ten 60 c.cm. aliquots which were stored in sterile 180 c.cm. bottles. Twelve of these subsidiary aliquots (one from each of the original blood samples) were used for immediate analysis; the remaining 108 were stored at 4° C. in the refrigerator and removed for analysis at different times.

Before analysis each of the small bottles was well shaken; part of the blood was centrifuged under oil and the plasma so obtained centrifuged again to free it completely from red blood-cells. Analyses are recorded in table II of plasma obtained in this way, after 3 days and after 16 days, from each of the samples 1–12.

TABLE II—COMPOSITION OF PLASMA (MG. PER 100 C.CM., UNCORRECTED FOR DILUTION)

Sample	C.cm. diluted plasma equivalent to 100 c.cm. undiluted plasma	Separated immediately		Separated after 2–4 days		Separated after 14–16 days	
		Potass.	Inorg. P.	Potass.	Inorg. P.	Potass.	Inorg. P.
1	108	25·2	3·06	70·6	3·00	132	6·66
2		20·1	3·13	..	3·12	125	5·46
3		17·3	2·61	54·6	3·36	123	5·05
4		22·3	3·22	49·5	3·65	133	6·63
5	103	18·8	3·50	57·3	3·25	136	7·25
6		21·8	3·87	59·1	3·61	121	9·97
7		24·3	3·85	63·1	3·58	136	6·82
8		21·9	4·10	80·5	4·35	133	11·40
9	108	22·4	2·59	72·0	1·74	121	5·55
10		23·1	3·33	60·8	2·34	105	4·01
11		15·7	2·91	50·6	2·30	116	3·97
12		26·4	4·06	62·8	2·55	120	6·27
13	191	11·1	1·26	..	..	60·5	2·80
14		14·1	1·31	..	..	45·7	3·02
15		21·4	1·54	..	..	46·9	3·20
16		10·0	2·14	..	..	58·5	2·77
17		9·6	1·62	..	..	52·5	3·07
18		14·1	2·02	..	..	41·0	2·65
19	191	15·1	1·69	..	..	51·6	2·31
20		20·6	1·92	..	..	53·6	2·97
21		12·6	2·04	..	..	51·5	2·90
22		8·5	1·42	..	..	62·6	2·23
23		14·6	1·67	..	..	58·5	2·50
24		14·2	1·82	..	..	59·6	2·77
25	191	16·6	1·66	..	..	56·3	2·30
26		14·7	1·75	..	..	84·5	2·47
27		14·1	1·50	..	..	53·5	2·52
28		13·9	1·46	..	..	52·2	2·30
29		12·6	1·21	..	..	54·6	2·42
30		20·0	1·94	..	..	76·0	2·27
31	191	18·0	2·33	..	..	54·7	3·70
32		19·7	1·67	..	..	65·0	3·15
33		24·0	1·82	..	..	77·0	3·05
34		24·8	1·74	..	..	49·3	2·47
35		17·9	1·82	..	..	59·5	2·62
36		17·6	1·75	..	..	58·8	2·95
37	134	..	..	..	..	98·7	2·93
38		..	..	..	..	78·8	3·10
39		..	..	..	..	72·7	2·53
40		..	..	..	..	98·6	2·54
41		..	..	..	..	68·0	2·48
42		..	..	..	..	73·2	2·16
43	134	..	..	68·3	1·64	..	..
44		..	..	58·0	2·02	..	..
45		..	..	45·4	1·98	..	..
46		..	..	63·8	1·78	..	..
47		..	..	35·0	1·64	..	..
48		..	..	65·0	1·68	..	..

Bottles 13–36. After being well mixed samples of 50 c.cm. were removed from each of the bottles for immediate analysis and the bottles were left at 4° C. for fourteen days. Plasma samples (20 c.cm.) were then removed by means of a sterile needle and syringe.

Bottles 37–42 were left for fourteen days at 4° C. and plasma was siphoned off into sterile bottles, care being taken not to disturb the cells or the pigmented layer of plasma immediately above them. This is essentially the general technique for obtaining plasma for storage.

Bottles 43–48 were treated as 37–42 except that the plasma was siphoned off after from two to four days.

DISCUSSION

Potassium, inorganic phosphate and hæmoglobin determinations were carried out on the plasma samples by the methods of Jacobs and Hoffman (1931), Fiske and Subbarow (1925) and Wu (1923) respectively, and some

of the results are recorded in table II. The analytical results in this table are not corrected for the dilution of the plasma by the preservative solutions. The data have been left in this form so that one can see at a glance the amounts of potassium and inorganic phosphate which would be given in transfusions with these diluted plasmas. For a comparison of the effects of different preservatives it is necessary, however, to apply a correction factor and to refer the results to the original undiluted plasma. The results so obtained are given in table III, where the mean values are given for each series of 4 or 6 samples stored under the same conditions.

TABLE III—POTASSIUM AND INORGANIC PHOSPHATE CONTENT OF PLASMA (MG. PER 100 C.CM., CORRECTED FOR DILUTION)

Series	Preservatives	Potass.	Inorg. P.
	Plasma removed after 14–16 days		
1–4	Citrate	139	6·4
5–8	Heparin	135	9·1
9–12	Citrate-glucose (1%)	124	5·3
13–18	Citrate-saline	97	5·6
19–24	Citrate-saline-glucose (1%)	107	5·0
25–30	Citrate-saline-glucose (3%)	120	4·5
31–36	Citrate-saline-dextrin	116	4·7
37–42	Citrate-saline-glucose (1%)	104	3·4
Mean	.. ..	116	5·3
	Plasma removed after 2–4 days		
1–4	Citrate	62	3·3
5–8	Heparin	67	3·9
9–12	Citrate-glucose (1%)	67	2·4
43–48	Citrate-saline-glucose (1%)	72	2·3
Mean	.. ..	67	2·9

For an accurate calculation of the diluting factors for any individual sample, hæmatocrit readings must be obtained before and after dilution, and also immediately before the separation of the plasma; and from these data corrections must be applied for any changes in cell volume, during storage, due to the passage of fluid in or out of the cells (Maizels and Whittaker 1939). With isotonic preservative solutions, no change in cell-volume will take place and this assumption has been made in calculating the data of table III. It was further assumed that the mean cell volume was 45%. Actually these assumptions are not strictly true, because the preservative solutions used are somewhat hypertonic.

As an example of the method of calculation we can consider the series 13–36: 200 c.cm. of citrate-saline were added to 400 c.cm. of blood (i.e., 180 c.cm. cells and 220 c.cm. of plasma), while the blood was diluted 50% the volume of plasma was increased from 220 c.cm. to 420 c.cm., a dilution of 91%; the correction factor to be applied to the results of table II for the series 13–36 is therefore 420/220 or 1·91.

AMOUNT OF HÆMOLYSIS

The plasma which separated above the sedimentated cells during the first few days of storage was yellow and showed no obvious trace of hæmoglobin. This appearance was maintained (in the absence of mechanical disturbance) throughout the period of storage except that a band of pigmented fluid appeared between the clear plasma and the cells. This band of hæmolysis consisted of a layer of plasma mixed with hæmoglobin from cells which had broken down. The thickness and colour of the band provided some criterion of the degree of hæmolysis.

If the plasma is removed by siphoning off from the undisturbed cells, it is possible to get large amounts of plasma free from any pronounced red colour, even from blood which is badly hæmolysed. The plasma so obtained (as in experiments 13–48) is not therefore completely representative of the total plasma in the container, as can be seen by shaking up the blood and comparing the plasma obtained after subsequent centrifugalisation. This was the technique adopted in experiments 1–12, in which cases the layer of hæmolysis when present was distributed throughout the mixtures and the resulting plasma was coloured by hæmoglobin.

The plasma obtained by the siphoning technique is similar to that used in plasma transfusions; the plasma obtained by centrifugalisation, is similar to that present in whole-blood transfusions, in which a preliminary shaking of the stored blood is essential. It must be noted, therefore, that the band of hæmolysis which formed during storage gave a better index of the amount of hæmolysis than the appearance of the supernatant plasma. In the 14–16 days blood, the band was most pronounced in the heparinised samples (5–8), rather less in the citrate samples (1–4 and 13–18) and least in the samples preserved with the addition of glucose. Chemical analyses showed that negligible amounts of hæmoglobin (never more than 50 mg. per 100 c.cm.) were present in the plasma obtained by the siphoning technique, corresponding to the absence of any obvious red colour in these samples. The 16-days-old plasma obtained by centrifugalisation showed pigmentation most in the heparin series, less in the citrate series and least in the citrate-glucose series, the amount of hæmoglobin per 100 c.cm. of plasma being 3·7 g., 1·8 g. and 0·2 g. respectively.

CHANGES IN POTASSIUM

The mean initial values of plasma potassium obtained with samples 1–12 as reported in our previous paper (1940) was 20 mg. The figures obtained from samples 13–36 were (after correction for dilution) rather higher than 20 mg., no doubt owing to the fact that a slightly longer period elapsed between the drawing of the blood and the separation of the plasma. These values correspond to samples of plasma taken within three hours of the removal of the blood. Our earlier data showed that the increase in potassium in the plasma began immediately after withdrawal of the blood and even in a few hours an increase was observed.

The figures in table II show that in all cases the plasma removed from the blood after 14–16 days contained greatly increased amounts of potassium, the values (uncorrected for dilution) ranging from 41–136 mg. potassium per 100 c.cm. plasma. A transfusion of 1 litre of this diluted plasma would therefore involve the administration of amounts of potassium between 0·4 g. and 1·4 g. When the mean values for the various groups of samples are corrected for dilution the potassium figures cover a much more limited range, between 97–139 mg. The figures supply little evidence regarding the superiority of one preservative solution over another; in all cases the amount of potassium is large compared with the initial values. The mean value of groups 1–12 obtained by the centrifugalisation technique (133 mg.% of potassium) is rather higher than the mean value obtained by the method of sampling undisturbed plasma (Nos. 13–42, mean value 109 mg. per 100 c.cm.), but the difference is not large compared with the total change which has taken place.

The plasma removed from blood 3–5 days old also had a high potassium content, the mean value for the undiluted blood being 67 mg. per 100 c.cm. of plasma, compared with the mean value of 116 mg. in the 14–16 days old plasma. These figures show that the increase in plasma potassium is extremely rapid in the first few days and later slows down, as can be seen by calculating the plasma potassium as a percentage of the total potassium in the blood; in fresh blood it represents about 5%; after 4 days about 17% and after 14 days about 30%. It has already been observed that the hæmoglobin from hæmolysed cells does not diffuse throughout the plasma in the absence of mechanical disturbance, but forms a layer of hæmolysis between the clear yellow plasma and the whole cells. This should be contrasted with the rapid diffusion of the potassium ions, presumably due to their small atomic weight and high mobility, which enable them to diffuse rapidly through the cell wall and through the layer of hæmolysis.

The above data agree with the work of Scudder (1939), DeGowin (1940), Downman (1940) and their colleagues, who have shown that none of the preservatives or diluents used were able to retard the escape of potassium from the cells, even though they differed in their ability to prevent hæmolysis.

CHANGE IN PLASMA INORGANIC PHOSPHATE

In all cases the plasma samples from blood 14–16 days old contained more inorganic phosphate than the fresh

plasma, the mean value for the series of 42 samples being 5·3 mg. per 100 c.cm. (corrected values) in contrast with the mean initial value of 3·35 mg. When the effects of the different preservative solutions are considered it appears that the values are highest in the heparin group (mean 9·1 mg.); the figures in the citrate and citrate saline groups (6·4 and 5·6 mg.) are somewhat higher than in the groups preserved with the addition of glucose (5·3, 5·0, 4·5 and 3·4 mg.). The lower values in the latter groups are in agreement with our preliminary experiments and are probably to be explained by the combination of the inorganic phosphate with the glucose and by the effect of glucose in retarding the breakdown of cellular organic phosphates.

Compared with the changes in potassium which have occurred over 14–16 days the increase in the phosphate level is small in spite of the high inorganic phosphate level inside the cells, which our previous work has shown to be about 30 mg. per 100 c.cm. at this stage. It is evident, as Maizels and Whittaker (1940), and others have also shown, that the cell-membrane is relatively impermeable to phosphate ion during the early stages of blood storage.

The 2–4 day plasma showed little change from the normal plasma-phosphate value; the slight decreases found in the sample preserved with glucose (Nos. 43–48, 9–12) can be explained by the formation of glucose-phosphate.

USE OF PLASMA IN TRANSFUSIONS

A point of immediate importance arising from the present work is the possible toxicity of the potassium in plasma from stored blood, and especially in that obtained from blood two weeks old. Our data shows that such plasma (undiluted) contains about 120 mg. potassium and therefore over 1·2 g. may be given in the transfusion of each litre of plasma. Scudder (1939), DeGowin (1940) and their colleagues have reported figures similar to our own and have discussed the toxicity of potassium in human subjects. They suggest that amounts of potassium equivalent to those quoted will not be harmful in most cases, but that care must be taken to avoid rapid administration of large amounts of stored blood or plasma in conditions associated with potassium retention and disturbances in salt metabolism. The possibility of reactions from this cause can be reduced considerably, it seems, by giving the blood slowly.

Clinical reports from various centres on the use of stored blood and plasma include occasional unexplained reactions, and some of these may be due to the potassium content of the transfusion fluid. It seems wise, therefore, to use plasma with the minimum potassium content until more precise information is available regarding the toxic doses, especially as cases of burns and shock—conditions in which plasma transfusions may often be used—may react unfavourably to potassium.

We recommend therefore the separation of the plasma as soon as possible after the withdrawal of the blood. This is best done by means of a small separator which will give a much better yield of plasma than can be obtained by the siphoning technique. If this procedure is adopted in a blood bank large quantities of cells will be discarded; whereas if the separation is postponed for 14 days the whole blood is available for use during that time. This waste of cells could be avoided in part by suspending the cells again in glucose-saline after removing the plasma early and storing it at 4° C. The cells would then be available for transfusions in which whole blood is necessary, and could be given either in glucose-saline or mixed with stored plasma. Work on these lines is now in progress.

PRESERVATION OF PLASMA AFTER SEPARATION

Several observers report that once separated from cells, sterile plasma can be stored for several months without change. We have obtained successful clinical results with such plasma. From the chemical point of view fewer changes can take place in separated plasma than in whole blood. Occasionally slight stringy precipitates have appeared in some of our experimental samples, and these were more pronounced in plasma which contained an obvious amount of fat, the fat being presumably carried out of solution with the protein precipitate. Apart from this precipitate, blood containing an excess of fat has a turbid appearance which may suggest bacterial contamination. Although it is impossible to expect donors to fast before giving their blood it is easy to ask them not to include too much fat in meals taken during the 8 hours prior to their being bled. Alternatively, blood which is obviously fatty might be used for whole-blood transfusions only, or the fat could be removed in a separator.

SUMMARY

Blood has been stored with heparin and citrate as anticoagulants with and without the addition of saline, glucose and dextrin.

The efficiency of a glucose-citrate mixture in retarding hæmolysis has been further demonstrated and plasma removed from blood stored 14 days in this mixture contained less than 50 mg. of hæmoglobin per 100 c.cm.

Plasma removed after 14–16 days from blood stored in eight different solutions contained large amounts of potassium, the mean figure being 116 mg. per 100 c.cm. undiluted plasma. None of the preservatives was effective in retarding this increase, which is independent of the rate of hæmolysis.

Plasma removed after 3–5 days also showed increased potassium levels (mean 67 mg. per 100 c.cm.) demonstrating that diffusion of potassium from the cells is very rapid in the early period of storage.

The changes in the inorganic-phosphate content of the plasma were relatively small.

The possibility of toxic reactions due to the potassium content of blood or plasma are considered and it seems desirable to separate the plasma from stored blood as soon as possible.

This work was carried out during the tenure of research grants from the Medical Research Council, to whom we express our thanks.

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LOCAL INUNCTION OF TESTOSTERONE IN CHRONIC MASTITIS

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It has been reported that testosterone propionate injected intramuscularly in doses of 25–100 mg. twice a week relieved the pain of chronic mastitis and somewhat reduced the size of the nodules (Spence 1939). I have found that daily local inunction with testosterone ointment also relieves the pain, but my observations have not been continued long enough to decide whether this treatment affects the size of the nodules.

In animals it has been established that local application of androgenic and œstrogenic substances produces a greater effect than when they are injected at some distance from the organ to be acted upon and reach it through the general circulation. Thus growth of the comb of the young chick can be caused by the application of remarkably small amounts of androsterone to the surface of the comb (Fussgänger 1934); in goats greatest mammary growth is obtained by inunction of the udder with an ointment of œstradiol benzoate (Fremery 1936); and in rats hypertrophy of the penis is caused by the local application of testosterone ointment (Greene and Wigodsky 1938).

TECHNIQUE

Eight patients with mammary pain have been treated by local inunction of testosterone or its propionate. The ointment is contained in collapsible tubes, and a measured

length of ointment containing a known amount of testosterone can be expressed from the nozzle. The patients were instructed to wash the breast thoroughly with soap and warm water before each application and then to rub in a measured strip of ointment for 15 min. nightly. Since the psychological factor is so important in some patients with mammary pain, all the patients were given to use during the first month of treatment a non-medicated ointment contained in the same type of tube labelled in the same manner as the medicated. They were thus unaware that they were at first using an inert substance.

CASE-RECORDS

CASE 1.—Married, aged 46. This patient was first seen in April, 1938, when she had a ten years' history of continuous pain in the left breast, which had been worse for the last two or three years. There were nodules in the outer halves of both breasts. She was treated for a year with various endocrine preparations—intramuscular injections of testosterone propionate in doses up to 100 mg. twice a week, œstradiol benzoate, and thyrotrophic hormone—all with little or no benefit.

Treatment for a month with non-medicated ointment brought about no change. She was then given testosterone-propionate ointment, which she rubbed into the breast daily for a month in amounts containing 10 mg. of testosterone propionate. The pain gradually diminished during the first two weeks, and was greatly eased during the second two weeks. During the next month she used ointment of free testosterone in amounts equivalent to 4 mg. of testosterone daily; pain during this month was slight, except for four days before her period. She was then given non-medicated ointment for a month; after ten days she had pain, which lasted until her period a week later, after which her pain was diminished but was greater than when she used medicated ointment. During the next month, when she was again given testosterone-propionate ointment in doses of 5 mg. of testosterone propionate daily, she had little or no pain. The sizes of the nodules were unchanged.

CASE 2.—Married, aged 33. This patient had also been previously treated with intramuscular injections of testosterone propionate for right mammary pain and a nodule as large as a walnut in the right breast. The pain was improved by placebo treatment consisting of intramuscular injections of olive oil. After the intramuscular administration of testosterone propionate 50 mg. twice a week for two months the nodule was considerably reduced in size, and it had disappeared when she was seen two months later. She was seen again a year later. During the last few months pain had recurred and was continuous and worse during the week before the periods. There was a large nodule in the external half of the right breast.

Treatment for a month with non-medicated ointment caused no change in the pain. Daily inunction of the right breast with ointment containing 3 mg. of testosterone improved the pain during the first two weeks, and during the next four weeks she was rarely troubled. After six weeks' treatment the nodule was about half its previous size.

CASE 3.—Married, aged 35, with twelve years' history of lumps and more or less continuous pain in both breasts, worse a week before each menstrual period. Both breasts were tender, and the external half of each contained a nodule about as large as a duck's egg.

Preliminary inunction of both breasts with non-medicated ointment caused no improvement. Daily inunction of each breast with a strip of ointment containing 5 mg. of testosterone was started immediately after a menstrual period and has now been continued for three months. During the first three weeks the pain was diminished, but during the week before the period it was as severe as before. After this period, however, the pain disappeared and recurred only slightly for two days during the week before the next period. The size of the nodule was unchanged.

CASE 4.—Married, aged 26, with ten years' history of a painful lump in the right breast. The pain was continuous and worse during the week before her periods. There was a large tender nodule in the external half of the right breast and a smaller one in the external half of the left breast.

Non-medicated ointment had no effect on the pain. Daily inunction with testosterone 4 mg. for a month did not cause any improvement. The dose was therefore increased to 10 mg. daily. After a month the pain was improved, but she still had some discomfort; the sizes of the nodules were unchanged. Owing to the war she was unable to attend for further treatment, but seen six months later she said that her pain had greatly improved since treatment and consequently she was not inclined to resume treatment.

CASE 5.—Married, aged 34. For sixteen years she had had more or less continuous pain in the left breast, worse during the week before her periods and eased during the period and for a few days afterwards. The left breast was larger than the right, but no other abnormality was discovered.

Non-medicated ointment did not cause any improvement. In spite of daily inunction with testosterone 4 mg. for two weeks she still had continuous pain. The dose was therefore increased to 10 mg. daily During the subsequent two weeks her pain was improved, and during the next four weeks she experienced only a slight burning sensation.

CASE 6.—Married, aged 26. For the last two months she had had pain in both breasts, greater in the left than in the right, for the two weeks before her periods. There was a tender diffuse granularity throughout the left breast; the right was normal.

Inunction of both breasts with non-medicated ointment during the two weeks before her period increased the pain. Daily inunction of each breast with testosterone 5 mg. during the three weeks before each period greatly eased the pain.

CASE 7.—Married, aged 40. For three months she had had continuous pain in the left breast and axilla; it was more severe during her periods and for four days before them. Both breasts felt granular, but no nodules were palpable.

Non-medicated ointment caused considerable improvement; she did not have any pain before or during her period, and only on two days during the next fortnight. She was then given testosterone ointment in doses containing testosterone 4 mg. daily for a month. During the first two weeks of this treatment improvement was maintained, but during the second two weeks she had more or less continuous pain, which, however, was said to be eased for a few hours after inunction. Two applications a day, night and morning, brought about relief, but any effect of testosterone can be discounted by the fact that she obtained relief with non-medicated ointment.

CASE 8.—Married, aged 32. For six months this patient had had pain in the right breast for two weeks before her periods; she observed that a lump in her right breast became larger at this time. For the last two weeks she had had pain in the left breast. There was a diffuse nodularity throughout both breasts.

Inunction with non-medicated ointment during the two weeks before her period caused the pain in the left breast to disappear and improved the pain in the right. Daily inunction with testosterone 4 mg. completely relieved the pain in the right breast. This result also should be discounted owing to the fact that she was relieved by inunction with non-medicated ointment.

CONCLUSIONS

Daily inunction of the breast with an ointment of testosterone or of testosterone propionate in doses of 3–10 mg. of active substance relieved mammary pain in six of eight patients with chronic mastitis. In the remaining two patients any effect of testosterone should be assessed with caution, because these patients obtained relief with a non-medicated ointment.

Treatment by inunction has the following advantages over intramuscular injections:—

(1) Since it can be easily performed by the patient, it obviates the necessity of frequent visits to the hospital and the inconvenience of injections.

(2) Since comparatively small doses are effective, it is cheaper than injections, which necessitate doses of 50–200 mg. a week.

(3) Because of the large doses required testosterone propionate administered by injection may cause increased growth of hair on the face, trunk, and limbs, hoarseness of the voice, suppression of the menses and/or hypertrophy of the clitoris (Spence 1939), whereas none of these complications have been observed with the small doses required by inunction.

(4) Inunction may be more effective than injections, because in case 1 it relieved pain which had been little, if at all benefited by intramuscular injections of testosterone propionate 100 mg. twice a week.

The effectiveness of local inunction with small doses of testosterone supports the view previously put forward

(Spence 1939) that in relieving the pain of chronic mastitis its action is probably local rather than through inhibition of the pituitary.

SUMMARY

Mammary pain was relieved in all of eight patients with chronic mastitis by daily inunction of the breast with an ointment of testosterone or of testosterone propionate containing 3–10 mg. of active substance. Preliminary treatment with non-medicated ointment as a control measure relieved the pain in two patients but was ineffective in the remaining six.

The advantages of inunction over intramuscular injections of testosterone propionate in the treatment of chronic mastitis are enumerated.

No undesirable side-effects, such as hirsuties and suppression of the menses, were observed.

I am indebted to Messrs. Ciba Ltd. for testosterone (Perandren) ointment, testosterone-propionate ointment, and non-medicated ointment, and to Organon Laboratories Ltd. for testosterone propionate (Neo-Hombreol) ointment.

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VISCERAL PAIN PRODUCED BY BALLOON DISTENSION OF THE JEJUNUM*

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Distension of parts of the alimentary tract of man by means of a swallowed balloon provides an accurate and controllable method of investigating bowel pain, and in this paper we describe some observations made on pain arising from balloon distension of the upper small bowel in normal subjects and in patients who had had their splanchnics divided.

A Miller-Abbott double lumen tube with terminal balloon was passed through the patient's nose into the pharynx and then swallowed. Under X-ray control the tube was observed to pass through the stomach and duodenum into the jejunum, and the terminal balloon was allowed to reach a point about 12 in. beyond the duodeno-jejunal flexure. It was then distended with air until the patient complained first of slight then of moderate pain. The apparatus was air-tight, but in these experiments only the volume of air injected was measured and not the pressure within the balloon. From the patient's description the severity, localisation, quality and time intensity curve of the pain were noted. The position of the balloon was again confirmed radiologically at the end of the experiment.

FINDINGS IN NORMAL SUBJECTS

In six healthy people the results were so similar that one account will suffice for all. Injection of 80–100 c.cm. of air into the balloon caused slight pain, 100–150 c.cm. of air moderately severe pain. There was a time lag of one to two seconds after injection of air before the pain was felt and the pain gradually built up to a plateau in another two to three seconds; if the pain was slight or moderate the plateau was maintained for five to six seconds and then the pain became less. If the pain was moderately severe the plateau persisted twice as long, but again tended to become easier. The quality of pain, as always, was difficult to describe. One of us (F. H. B.) described the pain as "like intestinal colic" but more severe and nauseating than any colic yet experienced; it was a characteristic pain that would be easily recognised again. Others described the pain as "stomach ache" and "sickening." If the pain was slight or moderate it was localised about 2 in. above the

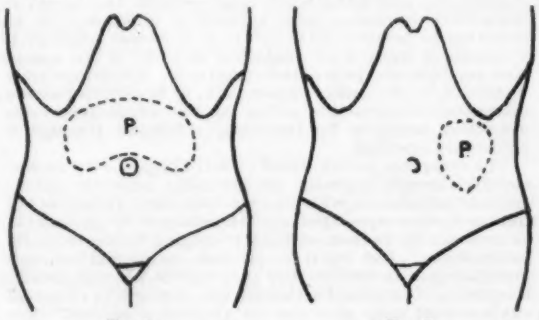

Fig. 1 Fig. 2

Fig. 1—Localisation of pain (P) after injection of 100–150 c.cm. of air in normal subjects.
Fig. 2—Localisation of pain (P) after injection of 150 c.cm. of air in case 1.

umbilicus over an area 2–5 in. in diameter centred on the mid-line. As the severity increased the area over which pain was felt increased also, until it occupied almost the whole upper abdomen (fig. 1). In one case, however, the pain was more on the right than the left; it was a diffuse pain difficult to locate exactly but seemed deep rather than superficial. In no case was cutaneous hyperalgesia, superficial or deep tenderness, or muscle rigidity observed.

FINDINGS AFTER SPLANCHNIC DIVISION

Three of the patients who volunteered for this experiment had had resection of the splanchnics and lower thoracic sympathetic chains performed for essential hypertension by one of us (R. S.) some time previously.

Case 1.—March 14, 1939. Excision right sympathetic chain from first lumbar ganglion to the ninth thoracic. Excision right splanchnics from cœliac ganglion upwards for 6 in.

March 21. Visceral sensation test with balloon. Injection of 100 c.cm. of air caused slight pain. Injection of 150 c.cm. caused moderately severe pain. Severity, quality and time-intensity curve were similar to the normals but localisation of pain was entirely to the left upper abdomen (fig. 2). No pain was felt on the right side. The observation was repeated four times. Injection of 200 c.cm. of air produced severe pain, but still none was felt in the right abdomen. No hyperalgesia, tenderness or rigidity.

March 23. Excision of left sympathetic chain and splanchnics as on right side.

April 3. Visceral sensation test repeated exactly as on March 21. When 150–200 c.cm. of air was injected into balloon patient felt no pain at all. Observation repeated four times.†

Case 2.—June 2 and July 14, 1937. Bilateral excision of sympathetic trunks from above diaphragm to the third ganglion above. Excision of splanchnics from cœliac ganglion upwards for 5 in.

April 1, 1939. Visceral sensation test with balloon. Balloon was distended with 150 c.cm. of air. Patient felt no pain. Observation repeated five times.

Case 3.—Feb. 19 and 26, 1937. Bilateral excision of sympathetic trunk from above diaphragm to the third ganglion above. Excision of splanchnics from cœliac ganglion upwards for 5 in.

April 3, 1939. Recently the blood-pressure of this patient had started to rise again, suggesting that some regeneration of autonomic fibres had occurred. Visceral sensation test with balloon. Injection of 140 c.cm. of air produced no pain or sensation. After three minutes, while looking at the X-ray screen the balloon was seen to move a distance of perhaps 2 in. up and down. At the same time the patient complained

* Part of this paper was presented to the Toronto Physiological Society in March 1939.

† The observations made in this case have been confirmed in another patient since this paper was written.

of sudden sharp pain lasting about one second located about 1 in. to the right and below the umbilicus. The balloon was left inflated for a further ten minutes. No more pain was felt.

DISCUSSION

Stimulus producing bowel pain.—While the bowel is insensitive to many pain stimuli it is known to be sensitive to tension, although it is not clear whether it is spasm of the gut or dilatation in front of the spasm that produces the pain of intestinal colic. Experimentally distension of the bowel causes pain, as is seen in balloon distension experiments either of the small bowel (as described here) or by inserting a balloon through a colostomy opening.

The receptors in the bowel are still imperfectly understood; morphologically recognisable sensory nerve-endings are absent, which means that they are probably free and unencapsulated and therefore it is impossible to separate them from endings belonging to the intrinsic innervation. But even if all free nerve-endings are morphologically similar they may not be physiologically the same. It is possible that certain changes in chemical environment may give rise to visceral sensation. For instance, the immediate beneficial effect of gastric lavage in relieving the nausea associated with eating some noxious substance suggests a local chemical stimulation rather than a toxic absorption as the cause of the nausea. In the heart the probable cause of anginal pain is a chemical substance produced in the ischæmic area, and the same possibility has not yet been excluded in the pain of bowel tension.

We mention these considerations because it seems premature to deny pain sensitivity to the bowel as Lewis and Kellgren (1939) have recently done, thus reverting to the original conception of Lennander. These authors suggest that bowel pain arises from traction on the sensitive mesentery; that if there were nerve-fibres in the gut wall in connexion with pain receptors it would be possible to stimulate these fibres by cutting, tearing and crushing them, since a nerve-fibre can be stimulated in any mechanical way whatever its receptor mechanism may be. But surely it depends on the number or density of pain fibres stimulated, and Lewis and Kellgren's comparison with cutting the optic nerve is unjust. It will be curious if bowel is different from all other tissues in having no pain sensitivity of its own, and further experiments are being carried out to try to elucidate this problem.

Pathway of visceral pain.—It has been realised since Langley's original description that visceral sensory fibres run with the autonomic nervous system. Anatomically each fibre is identical with a somatic sensory fibre having its cell of origin in the posterior root ganglion and sending its central process into the cord via the corresponding thoracic posterior root. By definition Langley excluded these fibres from the autonomic nervous system and considered all afferent fibres coursing with autonomic nerves and capable of giving rise to sensation as somatic. Because of the insensitivity of the bowel to cutaneous painful stimuli and of the relatively poor localisation of visceral pain it has been argued that visceral sensory fibres form a distinct and separate physiological system from somatic sensory fibres, and that no motor reflex or reference of pain occurs between the two physiological systems. The sensitivity of the bowel to the stimulus of tension alone is just a matter of a special type of receptor mechanism, and there are examples in somatic areas of specialised endings confined to certain regions; thus the cornea is sensitive mainly if not solely to pain, and so is the parietal peritoneum. The enteroceptors peculiar to muscle and tendon are not held to be distinct from the somatic sensory system. Pain due to spasm of striated muscle is comparable to bowel pain. As regards the poor localisation of visceral sensation certain somatic sensations are poorly localised—for example, cutaneous sensation on the dorsal surface of the body, pressure sense and muscle pain—and even in the highly sensitive cornea localisation is poor.

We believe that the difference between somatic and visceral sensations is only one of degree, and we prefer to draw no sharp distinction between visceral and somatic sensory systems but to look at them as part of one system in which there are different types of receptors responding to particular stimuli and varying degrees of accuracy of localisation. The terms somatic sensory and visceral sensory should indicate merely the anatomical origin of the sensation and not a distinct type of sensation with a special and separate physiological basis.

This view places visceral and somatic sensory fibres in the same system and provides a common anatomical basis for explaining pain references and motor reflexes whether from the abdomen, heart or body surface. This view is in agreement with additional evidence recently published by Lewis and Kellgren. In an interesting series of experiments in man they demonstrate the similarity of deep somatic pain produced by intramuscular injection of 6% sodium chloride and the visceral pain of angina pectoris and intestinal colic, a similarity that we can confirm by personal experiment, the pain of balloon distension of the jejunum being similar in its characteristics to deep muscle pain. Lewis and Kellgren's experiments led them to conclude that all deep pain, somatic and visceral, belongs to one common system of pain nerves and that all deep pain is of a similar or common pattern. This demonstration of the similarity of deep somatic and visceral pain is a notable advance, but we feel that the distinction between sharp, well-localised cutaneous pain and dull, vague deep pain from all deep tissues cannot always be clearly drawn. Thus from the parietal peritoneum, a deep tissue, pain tends to be sharp and well localised, even though such localisation is referred. It may be better on the available evidence to consider one general sensory nervous system with different degrees of pain sensitivity and accuracy of localisation rather than to make a sharp division between cutaneous and all forms of deep pain.

Our experiments with balloon distension confirm the visceral sensory fibres running with the autonomic nervous system as the pathway for bowel pain impulses to the central nervous system. We were interested to find such strict unilateral distribution of the pain in the patient in whom one splanchnic and sympathetic chain had been removed. It is curious that in a bilaterally innervated organ, such as the small bowel, the representation in the sensorium of each of its two sensory nerves is so strictly unilateral. In the case of the heart it has been shown clinically by White (1935) and experimentally by Moore (1938) that there is a purely homolateral innervation of each coronary-artery area, suggesting that there is very slight intercommunication between the right and left parts of the deep cardiac plexus. The same suggestion must apply to the mesenteric and cœliac plexuses so far as the sensory fibres for the bowel are concerned.

Viscero-somatic phenomena.—In our experiments in response to balloon distension of the bowel no cutaneous hyperalgesia, superficial or deep tenderness or muscular rigidity was observed. That is, there were no objective signs of a viscero-sensory radiation or motor reflex. The arguments for and against viscero-sensory radiation and viscero-motor reflex have been debated at length since the original papers of Ross, Lennander and Mackenzie. It is our belief that two of the assumptions used in this controversy no longer apply—the complete insensitivity of the viscera, and the physiological limitation of the visceral sensory fibres into a separate physiological system having no connexion with the somatic nervous system.

It is clear from clinical observations that a peritoneo-motor reflex occurs when the peritoneum is stimulated by inflammation. We believe it is also clear that a viscero-motor reflex can occur and that such reflexes are to be expected if our view of one common sensory nervous system is correct. They were not, it is true, present in the experiments here reported, but examples can be found, for example, the rectus rigidity sometimes present in angina pectoris, the rectus rigidity sometimes observed in pure gall-stone colic, and rectus contractions associated with experimental visceral stimulation (Miller and Simpson 1924, Cleland and Tait 1927, Lewis and Kellgren 1939).

In bowel pain, however, viscero-motor reflexes are not observed, either in colic, intestinal obstruction, intestinal strangulation, or experimental stimulation of the bowel. Lewis and Kellgren's experiments in cats, designed to show that visceral stimulation (pinch of the pancreas) would give rise to a motor reflex in the body wall,

showed equally that stimulation of the bowel failed to give such a response even when the bowel was distended with a pressure of air five times greater than the pressure we have found necessary to cause severe pain in man. It is important clinically to recognise the difference between the deep central dull pain of colic with no sensory or motor changes in the body wall and the localised peritoneal pain with rigidity of the overlying muscles, a clinical difference made clear by Morley (1931). But the fact that the stimulus causing bowel pain does not give rise to a somatic motor reflex does not justify the conclusion that no visceral stimulus will do so. Such responses do occur. The reason why or the mechanism by which one pain evokes a muscular reflex and another does not is obscure, but in our view the answer is not to be found in postulating two separate visceral and somatic systems.

SUMMARY

Experiments are described in which visceral pain is produced by distension of a swallowed balloon in the upper jejunum. The pain is felt diffusely across the upper abdomen.

After unilateral splanchnicectomy and lumbar sympathectomy pain is felt only on the non-operated side of the abdomen. After bilateral splanchnicectomy and lumbar sympathectomy no pain is experienced.

The stimulus and pathway to the spinal cord for visceral pain is discussed.

It is argued that visceral sensation is not a distinct type of sensation with a special and separate physiological basis. The difference between somatic and visceral sensation is only one of degree.

Cutaneous hyperalgesia and abdominal-wall motor reflexes are not observed as a result of balloon distension of the jejunum, or, clinically, in bowel colic. Such radiation and reflexes, however, are sometimes observed from other forms of visceral stimulation. The reason for this difference is as yet obscure.

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ANTISEPTIC ANALGESIC TANNIC-ACID JELLY FOR BURNS

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AND

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WHEN we were considering the use of an antiseptic tannic-acid jelly for burns in H.M. ships, in which bottles of tannic-acid solution might readily be broken in action at dressing-stations, Prof. W. C. Wilson of Aberdeen told us that he had had prepared for him in the dispensary at Edinburgh Royal Infirmary a jelly consisting of acriflavine 0·1% and tannic acid 20% with a glycerin-tragacanth base.

We prepared a similar jelly with proflavine sulphate 0·1%, and, having regard to the use of Nikalgin for burns in the last war, we considered the addition of an analgesic. Tannic acid precipitates alkaloids from solution, but its effect in a jelly was considered to be less rapid; so quinine and urea hydrochloride 0·5% was added. Slow precipitation took place, and chlorbutol 2% and procaine 2% were substituted in separate preparations. Chlorbutol gave very little relief. Procaine gave relief lasting about an hour and has been used more frequently.

Since in the great majority of infected burns reaching this hospital the predominating organism was *Staphylococcus pyogenes aureus*, the jelly was also made up with methyl violet 0·1% instead of proflavine sulphate. Our observations on the organisms normally present on the skin of naval ratings have proved that pyogenic staphylococci are commonly found.

The formula for the jelly is as follows:—

Tannic acid	20·0%
Proflavine sulphate	0·1%
Procaine	2·0%

in glycerin-tragacanth base.

Methyl violet may be substituted for proflavine sulphate. The glycerin-tragacanth base consists of:

Pulv. tragacanthæ co.	2·0%
Glycerin	10·0%
Distilled water	ad.100

The preparation is put up in collapsible tubes or, in hospital, stored in wide-necked well-stoppered bottles.

APPLICATION

On unbroken skin.—When the skin is erythematous and blisters have formed, the jelly is smeared fairly liberally over the affected area and well over the margin on to healthy skin. Two thicknesses of gauze are then applied intimately, another two are added, and with a thickness of wool the whole is bandaged and left for about a week. This was the routine adopted in the cases we have treated personally.

On the removal of the dressing at the end of a week the consistence of the jelly had altered according to the amount of evaporation and varied from that of an unguent to peeling flakes. Practically no damage was done to the tissues on removal of the gauze, which came away easily. In areas over which blisters had formed the hygroscopic action of the glycerin had caused the blister fluid to be withdrawn into the dressing; the wrinkled superficial epithelium covered the area. The surrounding skin was slightly dyed. None of these burns became infected.

On broken skin.—The jelly was applied in the same way as for unbroken skin. Where the blisters had ruptured a good tan-coagulum formed. This was separated at the end of ten to fourteen days, and the skin beneath, though thin, was soundly healed. The gauze incorporated in the coagulum facilitated its removal. None of these burns became infected. The tanned area, however, wherever joints were not involved, formed a continuous sheet; consequently there were no cracks. In two cases the burns affected the extensor and flexor aspects of the wrist. In these two cases no wool was used over the gauze dressings. The jelly dried fairly quickly, a good coagulum formed, and cracks developed. A slight amount of purulent exudate was noted, two days later, at the edges of the cracked tan. The patient, who complained of sore-throat, was observed on occasion to use his hand and wrist to shield his mouth on coughing. Bacteriological examination showed staphylococci (coagulase and hæmolysin-positive) present in the fauces and in the exudate from the wrist.

On fingers and hands.—Owing to the constricting effect of the tan on burns encircling fingers and hands completely, the tannic-acid jelly has not been used on such parts. Instead we recommend the use of a jelly of the following composition:—

Gentian or methyl violet	1·0%
Quinine and urea hydrochloride ..	0·5%

in glycerin-tragacanth base
(put up in collapsible tubes)

We have not yet had an opportunity of using this jelly, but gentian violet has been used by others as an antiseptic and coagulating agent in burns.

COMMENT

This tannic-acid jelly appears to have several advantages. Apart from its antiseptic and analgesic qualities, the hygroscopic action of the glycerin in withdrawing the blister fluid is beneficial in making resorption of this fluid impossible. Bacterial growth is diminished by this action of the glycerin and by increased penetration and concentration of the antiseptic dye.

We are trying to obtain a jelly which will make for equal ease in dressing and produce a pliable softer incrustation rather than the rigid tannic-acid eschar.

Our thanks are due to the Medical Director General of the Navy and to Surgeon Rear-Admiral H. E. R. Stephens, R.N., for permission to publish these notes; and to Surgeon Commander A. W. Kendall, R.N.V.R., and Surgeon Lieutenant F. G. Ward, R.N.V.R., for their coöperation.

Reviews of Books

First Aid for War Casualties

By NORMAN HAMMER, B.Sc., M.R.C.S., major, R.A.M.C. (retd.), lecturer and examiner to the St. John Ambulance Association. London: Dale, Reynolds and Co. Pp. 71. 1*s.* 6*d.*

NOWADAYS first-aid books, if not exactly three a penny, can be had for a shilling or so anywhere and the student may find it difficult to choose between them. Major Hammer's little book is full and strangely readable. His brief impassive descriptions call up striking pictures of war injuries and his directions for treatment have the same pictorial quality. He makes the reader see what the first-aid party is going to see, and handle the materials they will have to use. Advising on the treatment of a patient with fractured pelvis, for example, he says: "Put him into whatever position he finds most comfortable, raising or lowering the legs as he desires. Preferably, but by no means essentially, he should be flat on his back with his legs straight. Apply a broad bandage round his hips with the centre over the sacrum so that it is firm enough to give support but not so tight as to press broken bones inwards. Bandage both ankles and knees together. He should not be allowed to pass water. Remove him as for a case of fractured spine but face upwards." The book is nowhere discursive and is arranged in annotated paragraphs which give any text a dry look: but it never is dry. The ten sections into which it is divided cover possible war injuries among the civil population, first-aid for war wounds, wound shock, hæmorrhage, fractures, burns, asphyxia, concussion, fits, sudden childbirth, first-aid service in action and casualty collection in the field. Appendices deal with position on the stretcher, self-protection and a marking sheet useful in training tests and competitions. Major Hammer says he intends the book to be read with standard first-aid textbooks, but the first-aider will probably find himself turning, in a crisis of forgetfulness, more readily to this compact little manual than to a larger work which does not slip so readily into a pocket.

Obstetrics and Gynecology

By the departmental staff of the University of Chicago and other contributors. Edited by Prof. FRED. L. ADAIR, M.D., F.A.C.S., chairman of the department. London: Henry Kimpton. 2 vols. Pp. 1000 and 1031. £5.

OVER sixty members of the staff of the University of Chicago have contributed to this work, but no clue is afforded as to the author of any particular section. One person may have prepared the major portion of a chapter, but the result represents the judgment and effort of the group, and the result is balanced and conservative. The student is introduced to the subject in twenty pages and is then given a detailed description of the physiology and anatomy of reproduction, followed by chapters on the relationship of infection and immunity to reproduction. The treatment of gynæcological conditions with drugs, radiation and physiotherapy is discussed. The last chapter of this section describes the biochemical, nutritional and physiological changes in, and needs of, the pregnant woman. The second section contains an excellent short history of obstetrics and gynæcology. The authors then consider prenatal care, vital statistics, and the limitation of human reproduction, concluding with a description of history-taking and pelvic examination. The third section, after dealing belatedly with the life cycle of woman, passes to the subject of sterility, and thence to normal and abnormal conditions of the non-pregnant, pregnant and parturient woman. The second volume deals with the woman postpartum, the newborn infant, diseases of the female genitalia, and the interrelationship of the pregnant woman and medicine as a whole. The work ends with a description of obstetric and gynæcological operative procedures, including a long chapter on analgesia and anæsthesia. The appendix contains an article on dietetics.

The subject matter is impressive but the order of arrangement is a trifle bewildering. However, it makes easy reading, and the illustrations are prolific and clear. Professor Adair sets an example to future textbooks of obstetrics and gynæcology, which of recent years have exhibited a deplorable tendency toward the "shorter" or—even worse—"synopsis" species.

Heil Hunger

Health under Hitler. By Dr. M. GUMPERT. London: George Allen and Unwin. Pp. 128. 5*s.*

THIS book gives another instance of Hitler's broken promises. He pledged himself to lead the German people on the way to health and physical strength by a method of biological state control. Dr. Gumpert, expelled head of a large Berlin clinic, has collected, entirely from Nazi sources, statistical evidence to show the progressing deterioration of public health in the Third Reich. If his figures can be accepted at their face value they are impressive. The infant-mortality rate has risen, rickets and juvenile criminality have increased; alcoholism, venereal disease and suicides show an upward movement, as do industrial accidents. Tuberculosis and other infectious diseases (e.g., puerperal fever) have become more common and the average working capacity of labourers has definitely diminished. There is abundant evidence of malnutrition, and even the physical quality of recruits for the fighting services has deteriorated. Many of the improvements in public health and welfare services built up by republican Germany have been abolished—laws against child labour, for example. The booklet is unfortunately translated into poor English which in some places can only be understood by reconstructing the German original. Leaving politics aside, it seems somewhat difficult to reconcile this picture, drafted in March of this year, with the successes of Hitler's blitzkrieg since; but the whipping-up of a people into total mechanised warfare seems independent of the general condition of public health and may even be easier when physical and nervous overstrain are widespread. The question is how long such an artificially heated exertion can last. One point does seem to emerge clearly from Dr. Gumpert's figures—that the admittedly unfavourable influence of war conditions on public health has been acting in Germany for two years already.

Mammalian Genetics

and Manual for a Laboratory Course in Genetics (to accompany the textbook). By W. E. CASTLE, emeritus professor of genetics, Harvard University. London: Humphrey Milford, Oxford University Press. Pp. 169, 11*s.* 6*d.* and pp. 31, 3*s.*

Prof. Castle, one of the pioneers of genetics, has always been distinguished for his writings. His earlier book, "Genetics and Eugenics," introduced the subject to a host of readers and the present volume shows the same wise selection, simplicity, and good style. It gives a good résumé of present-day knowledge and should prove useful as a textbook. The complicated genetics of drosophila and of plants sometimes seem arid to those who are not professed biologists; Professor Castle illustrates from mammalian genetics principles which have been previously established on more convenient laboratory material, but he does not hesitate to complete the picture by reference to drosophila, fish and plants when necessary. The book might prove suitable as an introductory text for agricultural and veterinary students. They would find the concluding chapter on the more important gene mutations of domestic mammals an excellent link with the subsequent studies in animal husbandry. Less than 18 short pages, apart from tables, are devoted to the laboratory course. The practical work suggested is good, but the directions for carrying it out cannot escape being cursory. Emphasis is laid, however, on simple statistical examination of the ratios obtained, the student being encouraged to apply tests of significance to his results.

Recent Advances in Sex and Reproductive Physiology

(2nd ed.) By J. M. ROBSON, M.D., D.Sc., F.R.S.E. London: J. and A. Churchill. Pp. 329. 15*s.*

MOST of our knowledge of the physiology of reproduction is recent, and this book gives a clear account of it. The presentation is good, and there are few omissions in those parts of the subject concerned with physiological theory or clinical application. The author was unfortunate in the timing of the first edition which

appeared just before several important discoveries were made, so that this edition is not so much a revision as a new book. The chemical isolation of the internal secretions of the ovary and testis, the intensive study of their chemical relations, and the systematisation of their physiological effects have followed an ordered development of which Dr. Robson has taken full advantage. Probably the most noteworthy modification of outlook has resulted from a realisation that the so-called male and female sex hormones have widespread effects not confined to the sex with which they are popularly associated. Each one has a constellation of effects, some of which are common to other constellations, and the discovery of intermediate compounds, and even of apparently unrelated compounds with similar properties, suggests a delicacy in the balance of function which was at first unsuspected. The metabolic story of the hormones must take all this into account when it comes to be written; Dr. Robson has set down conservatively what is at present known of it. Menstruation, ovulation, pregnancy, lactation and the function of the pituitary are clearly discussed, and there are chapters on the excretion, the assay and the clinical uses of the various hormones.

New Inventions

GAS MASK FOR TRACHEOTOMISED PATIENT

THREE months ago I did a total laryngectomy for an extrinsic carcinoma of the larynx. Some weeks later the patient's wife wanted to know what protection against gas attack her husband would now have. Apparently the protection being provided for tracheotomised patients is large, cumbersome, and not very practicable for an ambulatory person, particularly when he is able to work.

In collaboration with Chas. A. King Ltd. several methods were tried with little success, for it was difficult to make a gas-tight fit round the many crevices in the neck and suprasternal region. Eventually a simple method was devised which adds little to the bulk of the civilian mask, and which can easily be put on by the patient without help. It consists of an ordinary civilian gas mask with a long rubber tube fixed above the filters (see figure). The lower end of this tube has a metal connexion which slips easily but firmly into a rubber tracheotomy tube. Exhaled air cannot be expelled in the ordinary way along the cheeks in the tracheotomised subject, so an extra exhaling valve is provided on the face-piece of the mask. The rubber tracheotomy tube fits the patient firmly with no leakage of air round the sides, but the patient is advised to encircle this with a moist handkerchief or strip of gauze.

It was found that in spite of the resistance of the long tube and the filters the patient could wear the appliance for ten minutes and more without distress or discomfort. The mask was also worn for five minutes in a standard gas-testing chamber without any discomfort or ill effects. The recognised safety period for the chamber is three to five minutes. C.A.P.—a lacrimator—was used in a concentrated form in a very confined space. The added precaution was taken of encircling the tracheotomy tube with a strip of moist gauze.

In a tracheotomised patient who does not wear a tube, a rubber tracheotomy tube could be fitted so that the same mask could be used.

A. RADCLIFFE, F.R.C.S.

In England Now

A Running Commentary by Peripatetic Correspondents

TEN days ago I joined a ship which has been working in the Thames estuary. My predecessor was said to be partial to methylated spirit and my brother officers viewed me with suspicion: "What's wrong with this one?" The result was, I was a little apart and was able to watch their reactions with detachment. We had ring-side seats for the bombing of London, sometimes almost in the ring itself. Some of the officers lived in London and they became silent and reserved. Later they humourised the situation: "If those swines have got my tomatoes . . ." A Scot who lived on the safe fringe of civilisation near Inverness almost achieved unpopularity by the statistical method: "If they keeled a million people, the betting would still be seven to one against . . . ." One mental picture I bring away from this trip and hope to retain. It is a fine sunny day and the Hun is attacking an industrial plant on the river. Six bombs causing large but different sized columns of water shake the earth and sky, and the anti-aircraft guns like dogs on chains bark savage answer. Sailing steadily through it all glides a sprit-sail barge. The bargee is at the wheel and his wife is with him, gazing up. They are apparently quite interested.

Coming through bombed London my heart went out to the late occupants of those heaps of lath and plaster that had been homes. There is something poignantly expressive in frowsy bed-clothes sticking out of rubble, in shabby household gods, bared to public gaze, especially in England where home life is a sacred thing apart. One could bear the smashed windows of city offices with comparative equanimity; they are so impersonal and some one felt might benefit from the fresh air. If this bombing goes on for long, how will these people adapt themselves? Will city men like prairie dogs sit solemn by their burrows, will Alice's world come true—strange communities below the ground, ten-storied buildings downwards? "O, I have a lovely flat beneath the river, it's on the six-hundred-foot level, so warm in winter, you know, and so quiet." After all it would not be the first time that man has had to go to earth.

* * *

No career could be more honourable or more exacting than that of the conscientious prophet, but taking them all round they have been shabbily treated throughout the ages. The prophets of our own times are our poets; and we cannot claim that they are an exception. When we are warned to beware of false prophets, we should visualise the modern politician who boasts that he has no time for poetry. It is characteristic of the seer that he is content to write for posterity. A corollary to this is that if we would gain an insight into the present we must look for it in the past. Nobody reading Locksley Hall could fail to be impressed by Tennyson's prophetic wisdom. When rumours of war were thick in the air last year and the newspapers were trying to assess the fighting capacities of the great air-fleets, those remarkable lines often appeared in leading articles:

Heard the heavens fill with shouting, and there rain'd a ghastly dew
From the nations' airy navies grappling in the central blue.

Now that the battle of Britain has begun, we see once again that the situation has been neatly summarised for us in advance by Milton. There is no need to labour the prophetic references to the R.A.F. fighters and to Field-Marshal Goering in these lines:

. . . Him the almighty Power
Hurled headlong flaming from the ethereal sky,
With hideous ruin and combustion, down to bottomless perdition;

Little wonder that Matthew Arnold said: "By nothing is England so glorious as by her poetry."

* * *

The purists would say that a hospital is no place for a dog, and the purists would undoubtedly be correct. Apart from the overwhelming body of evidence in support of that view on broad questions of principle, it is unfair to any dog, and especially a young dog, to expose him to the temptations that hospital life has to offer, temptations that strike at the very heart of doggy shape

and character. But if circumstances decree that a dog must be introduced to the corporate life of a hospital, then he should at least be named after a distinguished clinician, and so it was with Bobby. His godfather was in his later years rather a pompous ornament of our profession and would certainly have renounced Bobby, handsome, brown-eyed, long-haired dachshund as he is. Of respectable British parentage Bobby was a war baby in a country house when first we met him, and when at the age of two months he was taken to our home his very expression determined his name at once: Bobby it had to be. Two months later he embarked with us on the venture of creating an emergency hospital somewhere in England, and it was clear even from his excited if uncertain journey through the snow from station to hospital that he realised that big things lay ahead. His habits in these earlier days were a little uncertain and in confirmation of our worst fears he offered not a few affronts to Hygeia, but he lived down these weaknesses and soon became a respectable member of society.

Bobby hates to be alone. It was a long time before he learned to accept with resignation a command to stay by himself even in his master's room, and often he made ward visits that no good dog should have made. He loves to chew and his tastes are catholic—papers, even the King's papers, pencils, mats, washing cloths, slippers, all come alike to Bobby. Nor is his chewing confined to the trivial things of life, for on one occasion he made deadly play with his master's hat and coat (usual harbingers of walks, carelessly left within reach) and on another he was with difficulty compelled to desist from applying traction to the trousers of a distinguished visitor, none other than the Admiral himself. Not that Bobby is lacking in discrimination. He is on friendly barking, tail-wagging terms with most members of the staff, but, apart from his foster parents he will only stay with his dyspeptic Uncle Andrew, the anæsthetist, who finds him a great comfort applied externally, muff-wise, to the pit of his stomach. He is not fond of surgeons, or any other sect wont to parade in strange raiment; he finds a hospital particularly trying on that account. If he has a fault it is that he is lacking in reverence. He does not seem to treat even Matron's office, that holy of holies, as sacred ground, but as a place strewn with carpets eminently chewable; then, as if to emphasise that after all his intentions are honourable, he sometimes trots gently into religious services without as much as a bark or the flicker of an eyelid. He has been known to introduce a disruptive element to some of our concerts (not that he is altogether blameworthy in that); violinists and high notes he cannot abide.

He has a considerable value as an indication to the hospital that Authority is on its rounds, for he usually runs in front of any official procession and by so doing has doubtless often simplified life for everybody. On one occasion when he tarried to investigate an odour Authority encountered a sight that gave Matron's matronly heart palpitation, but he retrieved the situation by such a bout of horrified barking that even Matron felt that justice had been done. Indeed, as a custodian of order and propriety he is invaluable. When we had in hospital a large number of French patients apt to perambulate our grounds in varying degrees of undress he was wont to pursue the more ungodly and drive them to cover by sheer insistent barking. It was not an unusual sight to see an erring Frenchman skipping lightly through the bushes pursued by a labouring military policeman with Bobby running behind in full cry. He added a touch of colour to what would otherwise have been but a melancholy episode. He is perhaps rather a nuisance when put out for his evening exercise, for he has an uncanny flair for spotting in the darkness the amorous couples in which our grounds abound about that time, and he tells the whole world about them. One bright day someone will put arsenic in his milk.

* * *

Robert's Sunday morning bath (for we do call him Robert on Sundays when we remember) is an institution and a constant source of joy to the patients. He is taken by the scruff of the neck and placed firmly in the fountain. Thence he is carried—shaking himself vigorously—to the nearest lawn, where he sets about the process of drying by the most extraordinary contortions, driving himself through the grass like a wheelbarrow. For many of our patients Bobby is the first object of interest that greets convalescence. As they graduate to the bed by the window they see his excited dancings across the lawn, and when they are able to get out and meet him in the flesh they feel they have passed into reality from a world of make-believe. Even when he is naughty (which is often) he is a likeable kind of beast. There is something wholly disarming in the obvious sincerity of his welcome as he rushes across in his lop-sided kind of way, ears streaming in the wind, to greet his returned pals, and a certain borrowed satisfaction in the snort of contentment that meets the friendly greeting. His dreamy eyes and his flat feet go equally well with contrition or with doggy sympathy, and when he brings a patient's slipper to our office from goodness knows where we can but hope that someday growth in grace will parallel his growth in length.

* * *

"Humph! Humph!", said the headmaster digging me in the ribs, "a clumsy translator you; like an elephant peeling oranges." The simile came back to me as I walked along Bankside and over Southwark Bridge, watching a gas-bag sporting in the wind. Had the medium been water it might have been a gallumphing whale, or a frolicksome shark caught by the nose. But it was air, with the clouds gone grey, and there was no other aerial or terrestrial beast to which I could compare it, for the hippopotamus is, in effect, aquatic, and I could not imagine such graceful clumsiness on the part of a rhinoceros even when spurred into the charge. At first it looked recalcitrant at being pulled down in a rising wind, till it started to turn complete back somersaults, with its blunt nose foremost, showing the whole of its belly to my view. It had broken loose and I wondered whether it would puncture itself on St. Paul's until the great building of the Vintners hid it from my view.

* * *

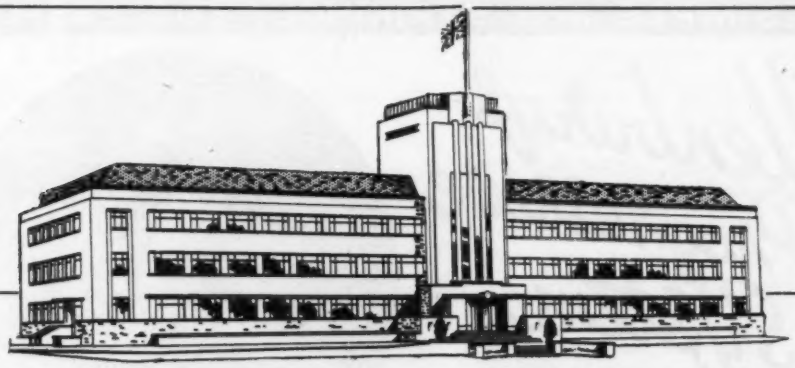
Things might be worse. On September 1, 1939, when shooting began, I was not able to go as usual after partridges; but, within a week, an unexpected opportunity arose and I had a right and left at them. Before the season ended I had a few more and some pheasants, pigeons and rabbits into the bargain. When November came I sighed wistfully. "No more hunting for you, my lad, till the end of the war," I said to myself; but I was wrong. Last week I contrived to slip up to an old haunt on the moor for a couple of days' cubbing, and though fields were small and scent was catchy enjoyed it as much as ever. For the benefit of three of us the master arranged an extra meet (there's glory for you!) and a kind friend lent me his thoroughbred, a great red Irish six-year-old, who goes like the wind and hedge-hops like a Hurricane. Cubs, though elusive, were plentiful and I saw a hoody doing victory rolls apparently for fun. And there were a few grouse and an occasional snipe to be seen. And the beer was good—every pint of it. I returned to work with a morale as high as a steeple.

* * *

We are settling down now to the A.A. barrage, and I find that the things which disturb my night's slumbers are adventitious sounds—like the dog chewing a chicken carcase or the flapping of a gate. The things that rile me are the interminable discussions—especially by the womenfolk—of bombings and what happened to Mrs. So-and-So and the wonderful escape of family X; that and the fact that our shops still pull down the shutters the minute the warning goes, particularly the chain stores.

* * *

I motor down to the cottage every evening with a carload of nurses to give them a quiet night in the country. We sleep them in camp beds all over the cottage and at times the population reaches a dozen. I fear this picnic will soon cease when the blackout gets earlier, and even now a crisis in my petrol consumption is arising, but it has been good fun and literally amazing to see an over-wrought sleepless nurse return to normal after a quiet evening before a log fire and a night's real rest.



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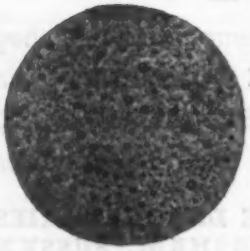

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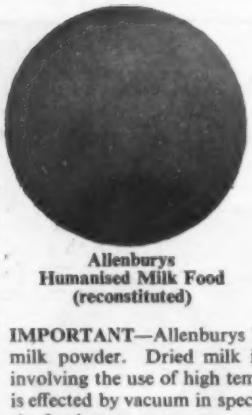

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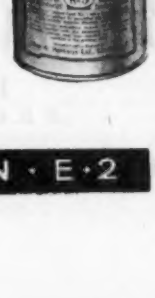

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LONDON: SATURDAY, SEPTEMBER 28, 1940

RESTITUTIO AD INTEGRUM

THE mature person is never willing to be a passenger. An injury which disables him, whether temporarily or permanently, attacks his self-respect as well as his livelihood. Charity and sympathy mean little to him compared with an opportunity to recover his independence; and rehabilitation should aim at providing nothing less than that opportunity. Rehabilitation and vocational training are designed to meet different needs. The man who is disabled for a time by an injury but capable of complete recovery requires rehabilitation. The man with a permanently disabling injury requires vocational training to fit him to earn his living in competition with whole men. Rehabilitation means restoration, vocational training, patching up. At this time, when facilities for the care and training of the injured and disabled might reasonably be extended as rapidly as possible, many centres are closing down and that in spite of increasing industrial opportunities for disabled men. Actually the position is worse than it was a year ago; the annual report of the Central Council for the Care of Cripples gives a disheartening picture of diminished training opportunities and frustrated development schemes. Among the training centres which have closed are the Stanmore Cripples' Training College which has been taken over by the Ministry of Health, the Cripples' Home and Industrial School for Girls at Halliwick, and the Robert Jones Memorial Workshops for Cripples at Liverpool. Durham Orthopædic Hospital, for which the trustees of the Nuffield Fund for Cripples had guaranteed £100,000, and for which the site was purchased, could not be built because the Ministry of Health found it impossible to grant permission to proceed. Plans for a new central orthopædic hospital for East Anglia, or for separate hospitals for the three counties, have also had to be given up. The development of a new orthopædic department at the Royal Victoria Hospital, Belfast, has been postponed. The sittings of the Royal Commission on Workmen's Compensation—which was to have considered rehabilitation and vocational training—have been suspended and the war has delayed the implementing of the recommendations of the Interdepartmental Committee on rehabilitation of persons injured by accidents. The Unemployment Assistance Board is not accepting new applications for training grants from cripples. Against this unpromising state in England and Northern Ireland must be set the position in Scotland, where plans are being made for developing a complete orthopædic scheme throughout the country and where the Glasgow Royal Infirmary has opened a new rehabilitation clinic and has accepted a scheme for converting the Philipshill branch into an orthopædic hospital.

The Central Council, in a new pamphlet,[1] plead for a system in which the patient will pass from the hospital or fracture clinic to remedial and training centres where he will either be made fit to resume his former work or learn some alternative employment. This is not so easily achieved as might be hoped. Those who need treatment fall at present into five different categories, and five different bodies are responsible for them. The categories are as follows: temporary disabled (1) service men and (2) civilians requiring rehabilitation; permanently disabled (3) service men and (4) civilians requiring vocational training; (5) children and young people requiring vocational training. Temporarily disabled service men may be treated either in Army hospitals, where they are under the Army and treated by the R.A.M.C., or in E.M.S. hospitals, where they are under the Ministry of Health and treated by civilian medical officers. Temporarily disabled civilians are treated in E.M.S. hospitals and come under the Ministry of Health. Permanently disabled service men come under the Ministry of Pensions, permanently disabled civilians under the Ministry of Labour, children and young persons under the Board of Education. Any scheme for the treatment of civilians must of course provide for segregation of the sexes. The problem of coördinating the work of these different bodies is formidable.

After clinical treatment of the injury, as the Central Council point out, the first stage in rehabilitation is reconditioning—treatment which will help the patient to regain as much function as possible in the shortest possible time, and to recover his habit of work. Sir Robert Jones, towards the end of the last war, pointed out that better results could be obtained with manual occupation suited to a particular disability than with massage and physical therapy alone. Reconditioning requires supervision from a surgeon, and the interdepartmental committee mentioned above recommended that it should be carried out in fracture clinics attached to hospitals. Others suggest that patients should be transferred to special rehabilitation or reconditioning centres like the small pioneer centre established at Crewe by the L.M.S. for their employees. Wherever the patient is treated, reconditioning consists of either gymnastic exercises and games or of occupational therapy. Physical treatment such as massage, electrical stimulation and baths, though valuable, tends to focus the patient's attention on the damaged part, whereas gymnastic exercises and games do the reverse. In playing table tennis or punching a ball a man is making an unconscious effort to achieve muscular coördination, and the action becomes automatic all the sooner. The use of games and exercises in rehabilitation has been given extensive trial at the model fracture clinic of the Albert Dock Hospital, where getting fit is regarded as a whole-time job and where games are as far as possible competitive. Occupational therapy has been tried far more freely in the United States and Canada than here; the only recognised training school for occupational therapists now open in England is Dorset House, Bristol, directed by Dr. Elizabeth Casson and associated with the Allendale Curative Workshop. Until the outbreak of war patients were treated by occupational therapy at the Astley Ainslie Institute, Edinburgh, but this part of the institute's work has now unfortunately closed down. The Central Council place a high value on this aspect of rehabilitation, which they insist must be carried out with a definite therapeutic

1. Civilian and War Injuries, London. 3*d*.

aim, directed by a trained therapist and supervised by an orthopædic surgeon. But they believe that it is essential for the patient to get away from the "arts and crafts" type of occupation as soon as possible and turn to productive work which carries the hope of future employment; for this reason they hold that occupational therapy can best be carried on in a workshop, and preferably the workshop of a vocational training centre. There are, however, objections to this. Patients undergoing rehabilitation are receiving clinical treatment; they are not being trained to a trade. The tasks they do in the workshop have a therapeutic aim and it does not matter much if they waste material provided they improve physically. In a vocational training centre the aim is different; the workers are achieving economic independence in spite of a permanent physical disability, and it is important for their outlook that the workshop should be productive and acting as a successful trading centre. Both types of training are given at St. Loyes' Training Centre for Cripples at Exeter, where a pioneer occupational department has recently been opened; this centre has now been approved by the Ministry of Health for dealing with war casualties.

All vocational training at special centres should be devised with a view to finding the patient subsequent employment—a principle which the Central Council have always maintained. The first aim is to provide the disabled man in as short a time as possible with technical qualifications that will offset his handicap. If he can return to his former work, well and good; if not, he must not be allowed to attain a qualification for which there is no demand. The American Federal Board of Rehabilitation have noted more than 700 occupations in which cripples have made good, and the list is still growing. The Central Council recommend that those drawing up a scheme for vocational training should consult with employers and trade-union officials. In the same way the Ministry of Pensions might keep in close touch with the Ministry of Labour when choosing occupations for disabled men. In the Army training centres set up after the last war the occupations taught varied from year to year according to the labour market. Several cripple-training colleges, including St. Loyes' and Leatherhead Court, provide short-term courses which qualify a man to take up the making, checking, assembling or packing of small parts and accessories for the electrical, wireless and motor-car industries. Both St. Loyes' and Leatherhead report increased activity and quicker placing of trainees since war began. The Ministry of Labour has a number of training centres where men between 16 and 45, not too severely disabled, are put through a six-months' course fitting them for some branch of the engineering trade. Longer courses of training were given at Stanmore and are still given at the Derwen Cripples' Training College, Oswestry, the minimum stay being the three years recommended by the Board of Education. Some disabled workers—in peace-time a relatively small number—though able to do a full day's work need sheltered conditions with medical supervision and protection from competition in the open market. A few of the training centres make provision for these patients, notably St. Loyes' and John Groom's Crippleage and Flower Girls' Mission at Edgware. In special cases residential settlements may be needed, successful examples being Papworth Village Settlement for men disabled by tuberculosis, and Enham Village Centre for men crippled in the last war. Enham has taken the bold step of meeting war conditions by expansion instead of contraction, and has been fully justified by the event. At the beginning of the year the governing body decided to spend nearly all their special funds on building and equipping a new factory and putting it into immediate action. This factory has been able to do useful work, and the deficit on the work of 1938 has been replaced by a substantial balance. This is a centre which might well be extended and helped to meet the needs of those disabled in the present war.

Throughout their period of vocational training patients are undergoing psychological reconditioning; they are being restored to the status of workers. Most of them achieve this return to normal unconsciously, but a few will need special help, and the Central Council would have a psychiatrist attached to the staff of every centre. The injured man should be helped to a progressive recovery beginning with clinical treatment and passing by way of rehabilitation or vocational training to that economic independence which is the coping stone of success. To achieve this end the council believe that the following facilities are necessary—adequate first-aid and ambulance services; well-equipped orthopædic hospitals with physiotherapy departments, or, failing these, fracture clinics in general hospitals; reconditioning centres with workshops for occupational therapy and gymnasiums and playing fields; vocational training centres equipped with workshops, lecture-rooms and library; sheltered workshops for the minority who cannot return to outside employment; and hostels for men and women undergoing training or employed in sheltered workshops. Various centres of the kind could probably be provided without great difficulty from materials already to hand. The Regius Professor of Medicine at Oxford and Professor Gask, in a letter to the *Times* of Sept. 17, drew attention to the object of the Nuffield Provincial Hospitals Trust. Its scheme aims at bringing voluntary and municipal hospitals into a unified system, and the signatories suggest that an organised service for the treatment of injuries should be an essential feature of each region. This would make a practical beginning, but the real need of the moment is an integration of the work of the five national bodies which control the treatment of the injured person. The patient, however much he is bandied about, remains a single person requiring carefully graded treatment. If a surgeon in an orthopædic hospital treats an injury he wants to know that when the case is transferred to another centre it will be under the care of someone with similar clinical standards. This is especially true of nerve injuries, which more than any others require continuity of observation and treatment. Would it not be possible to bring the care of all disabled persons under one, or at most two, of the controlling bodies? Failing that, how can effective medical liaison be achieved between Army, Ministries of Health, Pensions and Labour, and Board of Education? It would be a big task and, as we have already suggested, a worthy one for a great statesman.

COLDS AND VACCINES

LATE autumn is the season for the first visitation of common colds, and doctors and patients alike are now busying themselves with their pet prophylactics. For some—and they include men of science—vitamins are the thing, and the protagonists of orange juice vie in their enthusiasm with the die-hard defenders of cod-liver oil. Others prefer local instillations or inhalations, but these are to be used more as abortifacients of incipient colds than as prophylactics. Still others insist on their autumnal course of injections of one or other of the many stock anticatarrhal vaccines, and not all the statistics or experiments will convince them that they are not thereby protected against recurrent winter colds. The bacteriological evidence in support of such an attitude, if not convincing, is not wholly negative; true, the controlled trials, of which the two conducted in Minnesota [1] are an excellent example, usually prove that the control group has no greater incidence of colds than the vaccinated group. On the ætiological side, too, the laboratory and epidemiological data are mostly in favour of a virus being the causal agent. But colds have a diversity of origins and endings; for example, it seems likely that a proportion of "colds" are due to the activation of a latent bacterial infection in sinuses or nasopharynx, while others go on to secondary infection of sinuses and bronchi. WEBSTER and CLOW [2] found a correlation between upper respiratory tract infection and a carrier-state of pneumococci, hæmolytic streptococci and Pfeiffer's bacillus; chronic carriers of these organisms had frequent winter colds whereas non-carriers usually escaped. STRAKER and others [3] found no such association but did record a significant increase in nasal carriers of pneumococci among victims of colds a week or so after onset. If then a proportion of so-called colds are primary bacterial infections and others—presumably virus in origin—are followed by secondary bacterial invasion, are mixed vaccines of pneumococci and streptococci likely to prevent or mitigate the severity of these infections? Here another obstacle presents itself, for the serological variety of the pneumococcus, hæmolytic streptococcus and Pfeiffer's bacillus would necessitate a vaccine containing 50–60 different strains of bacteria if protection against all the serological types of these organisms were to be attempted. Is it possible that the stock vaccine increases group-specific antibody or simply stimulates the antibody mechanism non-specifically so that it more readily reacts to and wards off secondary bacterial infection? ALVAREZ in his "The March of Medicine" says that the Metropolitan Life Insurance Company several years ago took 5000 of their employees and vaccinated half of them against colds. At the end of the year they found that the two groups had had about the same average incidence of colds, but the vaccinated people had got back to work after their colds, on the average, several days sooner than the others. Again, is the apparent liability to colds on return to the city after a country holiday due to a temporary lowering of immunity from lack of stimulation by the causal agents? If so, the prophylactic course of anticatarrhal vaccine may still have its place in the scheme of things.

1. See *Lancet*, 1938, **2**, 951; Diehl, H. S., Baker, A. B. and Cowan, D. W. *J. Amer. med. Ass.* Aug. 24, 1940, p. 593.
2. Webster, L. T. and Clow, A. D. (1932) *J. exp. Med.* **55**, 445.
3. Straker, E. and others (1939) *Rep. publ. Hlth med. Subj., Lond.* No. 90.

REFERRED PAIN

ALTHOUGH recognised and studied for many years, referred pain has proved almost as elusive of interpretation as the reaction to pin-prick of the legendary faith-healer of Deal.[1] The cause of its erroneous localisation has been a matter of speculation and has often been sought in an assumed difference between visceral and parietal sensibility. Even now much about referred pain remains problematical, but recent work at least points to the direction in which we must look for a solution. Referred pain presents to clinical observation two reciprocal aspects. Visceral disease may cause pain which besides being somewhat vaguely localised in the diseased organ irradiates into the superficial tissues which share with it a common spinal segmental innervation. The reference of anginal pain to the left upper limb is a familiar example of this. Indeed it sometimes happens that the referred pain is so obtrusive that investigation is directed to the superficial structure instead of to the organ in which it originates. Conversely, as every student learns, pain referred from a lesion of the segmental spinal roots may be mistaken for a symptom of visceral disease. GUTTSTEIN-GOOD, under the term "idiopathic myalgia," has lately described [2] a painful affection of the muscles which may cause referred pain and may simulate serious visceral disease, as pointed out by HARMAN and YOUNG.[3] The remote reference of pain from painful lesions of muscles has been studied by KELLGREN, and a good many years ago BRISCOE drew attention to the production of irradiating pain resembling angina of effort by tonic spasm of certain thoracic muscles. The possibility that puzzling pains may be of muscular origin should be considered more often, especially when an incorrect diagnosis may threaten the patient with a dangerous malady. Moreover, immediate relief can often be obtained by injecting procaine into the tender spots in the muscles.

On another page Mr. BENTLEY and Mr. SMITHWICK record some observations on the pain evoked by distension of the small bowel. These lead them to conclusions which in certain respects are complementary to those of GUTTSTEIN-GOOD, for whereas he is dealing with a lesion of superficial tissues causing referred pain BENTLEY and SMITHWICK describe a visceral pain which though not very clearly localised and felt to be deep and somewhat diffuse is not referred, as most people can confirm from personal experience. It is clear, therefore, that not all visceral pain is referred, and not all referred pain is visceral in origin; hence referred pain is not necessarily associated with poor localisation of the primary pain, nor does it afford any support for a distinction between visceral and parietal sensibility.

1. There was once a faith-healer of Deal
Who said "Although pain isn't real
When I sit on a pin
And it punctures my skin
I dislike what I fancy I feel."
2. Guttstein-Good, M. *Lancet*, Sept. 14, 1940, p. 326.
3. Harman, J. B. and Young, R. H. *Ibid*, 1940, **1**, 1111.

LEWIS has described the liberation of a chemical substance capable of exciting pain at the sensory nerve-endings, and the existence of chemical substances playing a part in the transmission of impulses at the synapses of the central nervous system has been demonstrated. POLLOCK and DAVIS have suggested that a painful impulse from a viscus, on reaching the spinal cord, excites antidromic impulses in nerves running to the skin where a condition is set up capable of exciting pain impulses in those nerves. KINSELLA[4] conceives that a chemical pain-evoking substance may be liberated at the synaptic junctions of the spinal cord by nervous impulses reaching it either from the viscera by the sympathetic nerves, from the parietes by the somatic nerves, or from the mind along descending tracts. Referred pain on this hypothesis would be due to the liberation by way of the first route of the pain-evoking substance at synapses in the spinal cord shared by the visceral and somatic fibres—MACKENZIE'S "irritable focus" translated into chemical terms. The conception of a humoral basis for pain may well illuminate such conditions as causalgia, the painful phantom limb, the intractable central pain of brain-stem and thalamic lesions, and even psychogenic pain. To philosophers pain has been the type of the secondary quality, used to demonstrate the subjectivity of other sensations. "Why are whiteness and coldness in snow and pain not," writes LOCKE, "when it produces the one and the other idea in us, and can do neither but by the bulk, figure, number and motion of its solid parts"? Pain, however, may acquire a new objectivity if it proves to be the awareness of a chemical substance which future biochemists may extract and synthesise.

Annotations

PROGRESS IN HOSPITAL GROUPING

LAST December in the House of Commons Mr. Walter Elliot, then Minister of Health, announced the gift by Lord Nuffield of a million and a quarter pounds as the nucleus of a central fund for the coördination of hospital finance and policy in the provinces. Mr. Elliot then expressed a hope that despite the war a beginning should now be made with orderly planning. The motto, as Medicus, M.P. remarked, is not to be "business as usual" but "planning for the future," and it is appropriate that the stimulus should come from Oxford where it is now the rule to refer all questions of developing or extending clinical services to a joint hospitals' board on which university, medical schools and various professional associations are represented. The British Hospitals Association has already mapped out the country into convenient regions and a scheme has now been prepared for the establishment of a regional council for South Wales. The decision was reached at a conference at Cardiff over which Sir William Jenkins presided when Sir Farquhar Buzzard, speaking for the Nuffield Trust's medical advisory committee which is widely representative of practice and research, said it was essential that the replanning of hospital services should not be delayed. In any scheme the requirements of the patient should be the first consideration and applications for financial aid could only be considered when they came through a regional council which had worked out the provision of an efficient and coördinated service. It was pointed out that the Trust did not propose to interfere with the autonomy of individual hospitals, subject to their ability to adapt their services to rapidly changing social conditions. The regional council of South Wales will work through at least three divisional councils.

4. Kinsella, V. J. *Med. J. Aust.* 1940, 1, 681.

CANADIAN AND AMERICAN DOCTORS FOR THE E.M.S.

AN emergency order dated Sept. 14 enables the General Medical Council to register Canadian and U.S.A. doctors for the period of the war. This will make it possible for them to join the Emergency Medical Service with the privileges and responsibilities of a registered medical practitioner. It is not so long since all the provinces of Canada had medical reciprocity with the mother country but between 1926 and 1928 New Brunswick, Saskatchewan, Ontario and Quebec surrendered their right and it has needed a common danger to restore this time-honoured freedom. The fraternal relation with the U.S.A. is a new and welcome sign of the oneness at heart of the whole body of English-speaking medicine. Conditions of emergency registration are that the applicant is a British subject or a citizen of the U.S.A. and that he holds some medical degree or diploma recognised by the G.M.C. (for the purpose of this order) as furnishing a sufficient guarantee of the requisite knowledge and skill for the efficient practice of medicine, surgery and midwifery. The order, which is signed by the Home and Scottish Secretaries and the Minister of Health, may be cited as the Medical Register (Temporary Registration) Order 1940; it may be had from H.M. Stationery Office (1*d*.).

PUERPERAL FATALITY-RATE

EARLIER this year Yerushalmy, Palmer and Kramer, in discussing their records of mortality in women who had given birth to viable offspring coined the phrase "puerperal fatality-rate."[1] In a further analysis of their records, which are based on over a quarter million deliveries in New York State, they now consider the rate in relation to age and parity.[2] It is, as previous figures have shown, relatively high for first births (2·82 deaths per 1000 deliveries), falls to a minimum for third births (1·85), and then rises steadily with increasing birth order to reach 6·34 for eighth and ninth births. It falls to 4·42 for tenth or higher order births, but here the experience is small. The high rate for first births is again reached by the fifth birth, and this increasing risk of death with parity is not confined to certain causes of death but embraces them all. On the other hand, septicæmia forms a smaller proportion of all deaths among the higher order of births, while toxæmias are more common not only among first births but also among births of high order. Deaths from hæmorrhage form a far smaller proportion of the total among primiparæ than among multiparæ. The degree of change in these rates is shown by the following figures (deaths per 100,000 deliveries) for births of the first, third, and eighth or higher order: accidents of pregnancy 9, 17, 67; placenta prævia 4, 14, 50; septicæmia 75, 43, 117; eclampsia 55, 31, 67; accidents of childbirth 60, 40, 117. The risk to the mother of a premature baby is seven times as high as for a full-term birth.

The age of the mother and the order of birth are naturally correlated, and examination of the data for these two factors—by birth order for mothers of the same age and by age for births of the same order—shows that both have their influence. For instance, for mothers aged 25–29 the deaths per 1000 deliveries numbered 2·72 for first births, 2·01 for second births and 4·81 for eighth or higher order births. For second births

1. *Lancet*, 1940, 1, 142.
2. *Publ. Hlth Rep., Wash.* July 5, 1940, p. 1195.

the rates were 1·10 for mothers aged under 20, 2·01 for those aged 25–29 and 3·13 for those aged 40 or over. A double association was previously shown for rates of infant loss.[3] In another study of these data[4] it was also found that the infant neonatal losses were related to the age of the father, keeping the age of the wife constant, and it was suggested that as men grow older there may be a decline in the vitality of the offspring which they produce. But Yerushalmy and his co-workers find a similar relationship between the age of husband and puerperal fatality. The rate is generally high for young fathers, at a minimum for fathers aged 25–34, and high again for older fathers, independent of the correlation between the ages of husband and wife. The previous explanation of the association between age of father and rate of infant loss is, therefore, hardly tenable, but it may be that social differences between the components of the different age and birth-order groups play a part.

A GREAT ETHNOLOGIST

THE death of Charles Gabriel Seligman, F.R.C.P., F.R.S., at an Oxford nursing-home on Sept. 19 robs the medical profession of one of its most distinguished ethnologists. Left an orphan at an early age and brought up by his godfather, Seligman owed nothing to influence or to attractive appearance. It was through sheer merit, dogged perseverance and blunt honesty that he won his way to fame. At St. Paul's School he met C. S. Myers and Edwin Montagu, bird lover and future Secretary for India, and was drawn to biology, encouraged by that celebrated fly-fisherman, F. M. Halford, who was an enthusiastic amateur microscopist. From school Seligman passed to St. Thomas's Hospital, where he became house-physician and started to work at pathology under S. G. Shattock with the help of a Salter research fellowship. Meanwhile, however, he had been invited to join the Cambridge Anthropological Expedition, led by A. C. Haddon, to the Torres Islands and Borneo. Along with W. H. F. Rivers, William McDougall and Myers, and with characteristic thoroughness he went on ahead to get some preliminary experience of anthropological fieldwork among a hitherto unstudied tribe in North Queensland. At first he studied native diseases, observing the customs of women at parturition and at puberty; later he collected information on magic and on other practices, beliefs and ceremonies. In New Guinea he collected anthropological data and made observations on sensory acuity and colour vision. Returning to England in 1899 to become director of the clinical laboratory of his old hospital, his new love for ethnology was unquenchable, and in 1904 he embarked on the Daniels expedition to New Guinea, the results of which were set out in a monumental volume, "The Melanesians of British New Guinea" (1910), copiously illustrated and full of important material and conclusions. On getting back to England, once again—and for the last time—he returned to medicine, taking the gold medal in pathology at the Lond. M.D. and delivering a Hunterian lecture and contributing to the Royal Society on the relation between internal secretions and secondary sexual characters in the fowl. In 1908, assisted by his wife, a sister of Dr. R. N. Salaman, F.R.S., Seligman began his work among the Veddas, a very primitive people in Ceylon, whose legislative council had made a liberal grant to cover the expenses of the expedition. Under their joint authorship was published in 1911 an amply illustrated volume, "The Veddas," which must always remain the standard work on the history, social organisation, religion, magic, dances, and arts and crafts of this curiously interesting folk. In 1909, after a visit to Egypt, Charles and Brenda Seligman turned to African ethnology, spending much time in and around Darfur and Kordofan; the result was another heavily documented volume, "The Pagan Tribes of the Nilotic Sudan" (1932). For the Home University library Seligman wrote a more general book on "The Races of Africa." His reputation now firmly established, in 1910 he was appointed lecturer on ethnology in the University of London; in 1913 he became part-time professor of ethnology at the London School of Economics, having as his colleague there Prof. B. Malinowsky. In 1919 he was elected F.R.S. From 1923 to 1925 he served as president of the Royal Anthropological Institute; in 1932 he gave the Huxley memorial lecture and in 1933 the Frazer lecture at the institute. In the Huxley lecture he sought to interest the anthropologist in the study of symbolism by applying psycho-analysis to the folk-lore and dreams of primitive people and in the detection of the various Freudian phases of sexual life in native life and character. For many years now Seligman had been fighting ill health, but he continued bravely to work and to teach. On retirement from his university chair at the age of 60, he was presented with a valedictory volume of 29 essays by his pupils and colleagues. During the last seven years spent at his home in the little village of Toot Baldon, Oxford, he devoted himself to his collection of Chinese porcelain, for which he had built a small museum.

3. *Amer. J. Hyg.* 1938, **28**, 244; and *Publ. Hlth Rep., Wash.* 1940, **55**, 1010.
4. *Hum. Biol.* 1939, **11**, 342.

TEMPERATURE AND GASTRO-INTESTINAL ACTIVITY

BY recording gastro-intestinal activity under varying conditions, Bisgard and Nye[1] have shown the possible importance of simple treatment often regarded as merely palliative. They inserted balloons into the stomach and small intestine by the œsophageal route, and into the ileum and large intestine through well-established stomata. Patients were so selected that their alimentary movements were likely to be normal. It is notorious that contraction or relaxation of smooth muscle in response to a stimulus may depend among other things on its initial tonus, and there is a possibility that the balloons might have affected this. Assuming that the recorded response coincides with what would happen in the absence of apparatus, we may accept the authors' conclusion that heat and cold applied externally to the abdomen do not affect the alimentary tract in the same way as hot and cold drinks. Hot packs inhibit, while hot drinks stimulate gastro-intestinal movement. Conversely, ice packs stimulate and cold drinks have a slightly inhibitory action. Various clinical applications of these findings are discussed, most of them fairly obvious—for instance, the undesirability of applying cold externally to a person with a bleeding ulcer in the mistaken hope of inducing gastric quiescence. This consideration is heavily reinforced by the fact that such cold applications greatly increase gastric acidity, an effect which the authors think may be due to the liberation of a histamine-like substance. Animal experiments by other investigators suggest that the indirect temperature effect is reflex. The physiological aspect of the findings nevertheless needs elucidation. There is no difficulty in understanding the direct effects of heat and cold on contractile tissues, but the indirect effects are not so straightforward. One might argue that surface chilling, well-known to increase the tone of voluntary muscle, might well have the same effect on smooth muscle. On the other hand, the same stimulus is known to cause the release of adrenaline, and this has an inhibitory action on all but the sphincters of the alimentary tract. Meanwhile we look forward to the authors' promised attempt to add to the actual facts by an investigation of the possible effect of sphincter activity on the records.

1. Bisgard, J. D. and Nye, D. *Surg. Gynec. Obstet.* August, 1940, p. 172.

FEWER MEDICAL JOURNALS

SINCE the war we know less and less how the rest of the world wags. News becomes staler and scantier and the pile of foreign journals on the editorial table grows steadily smaller. From Europe during the past few months we have received at irregular intervals the *Schweizerische Medizinische Wochenschrift*—on Sept. 2 the issue of July 30 arrived; the *Acta Chirurgica Scandinavica* which is published at Stockholm arrives at long intervals (the issue of June 29 came to hand on Sept. 16); and at the end of August we were happy to welcome the new Spanish journal *Revista Clinica Espanola*. These are the only three journals we have lately received from Europe. For a belligerent this was perhaps only to be expected. But in the current issue of the *Journal of the American Medical Association* (Aug. 24, 1940, p. 618) the growing isolation even of a neutral is described: "Gradually since the end of May there has been a diminution in the receipt of medical publications coming from abroad. . . . The most recent shipment from Germany arrived on July 22, at which time, however, only two periodicals were received. On June 26 eight periodicals came, but the last large shipment arrived on May 27. Already, therefore, some of the German publications are more than three months in arrears. Some Austrian weekly publications which used to arrive every seven to ten days have not been received since early in June. Polish and Czechoslovakian journals have not been received for many months. . . . Within the last two months official notification has been received of the suspension of eleven French medical periodicals. From Italy the last weekly receipts were at the end of June and few Italian publications have come since that date." The article goes on to say "publications from Great Britain for June and July are being received with perhaps a very slight delay," and attributes the decline in foreign medical literature to the shortage of paper, to the fact that many men are engaged in military duties and to the blockade on shipping.

A PROSPECT OF HARLEY STREET

To think of the environs of the city of London two hundred years ago is to think of pastures and meadows, outlying villages and gentle streams; and usually one makes comparison with a sigh. But in the borough of Marylebone, region of lovely building, one can more willingly exchange the rustic for the urban mood and admit that the creeping city gave a fair exchange for all it took. Mr. Flemming has traced the history of Harley Street from the days when Marylebone village was part of the manor of Tyburn, so named in Domesday Book.[1] The river itself, the little Tyburn which ran down from Hampstead and found its way into the Thames at Westminster, was confined in a culvert by the beginning of the nineteenth century, and even its springs are now dried, so that in 1938 it was possible to make a part of the culvert into an air-raid shelter. But this is late history. The book tells how in earlier times the mayor and corporation of London used to ride out annually to inspect the tanks and conduits of Tyburn whence the city received its water; their wives came too in wagons, to banquet in a house built above the tanks and to watch their merchant husbands hunt the hare and the fox. Later Henry VIII made a deer-park here in which he and Elizabeth took sport and exercise; and in the eighteenth century the quality walked in Marylebone gardens. The contours of the land round Tyburn can still be traced in the gentle undulations of the streets near Marylebone Lane. Part of the manor of Tyburn was purchased in 1708 by John Holles, Earl of Clare, afterwards Duke of Newcastle, who married into the Cavendish family; later, by steps which Mr. Flemming traces, the land came into the possession of Edward Harley, Lord Oxford, and his wife Margaret Cavendish, and these two, abetted by the Adam brothers, were responsible for the streets of this charming district much as they are today. It was not until the second half of the nineteenth century that Harley Street became the haunt of consultants; even then it was still a select residential quarter for the laity—Mr. Gladstone himself lived there. Cavendish Square was the Olympus of the faculty before that time and to move even as much as five hundred yards away from it was regarded as professional suicide. But by the 'sixties, Harley Street had become the goal for consultants; and now, as Mr. Flemming points out, the public does not know how to distinguish between an address and a degree.

1. Harley Street, by Percy Flemming, F.R.C.S. London: H. K. Lewis and Co. 2s. 6d.

BELLYACHE AND THE LIKE

THE ages of man might be rewritten in terms of spasm. The windy spasm of infancy is only too familiar. Schoolboys recognise a green-apple syndrome. The young man with peptic ulcer obligingly produces an incisura opposite his lesion. In middle-age we choose any stone that takes our fancy to roll around our hollow viscera and muscular passages, and it must not be imagined that this is a time for relaxation. Having attained to years of indiscretion—which is the prostatic epoch—spasm in and about the urethra claims the attention of the male. It is not surprising, therefore, that pharmacologists search for antispasmodics with the assiduity of Jason in quest of the Golden Fleece. Graham and Lazarus[1] have investigated the action of Messrs. Ciba's synthetic antispasmodics Trasentin (diphenylacetyldiethylaminoethanol ester) and Trasentin-6H (diethylaminoethyl ester of phenyl cyclohexyl acetic acid). Their experimental work shows that trasentin-6H is about five times more powerful, weight for weight, than the original compound trasentin; and in antagonising the action of barium trasentin-6H is almost as potent as papaverine. The clinician who depends on atropine for relieving spasm is often baulked by the intolerable side effects of this drug when it is given in sufficiently large doses. He will therefore rejoice to learn that these disadvantages are nearly absent when trasentin-6H is used. This new antispasmodic is said to be 25% more toxic than atropine, but this is of no practical importance in a compound which has such remarkable pharmacological properties. Graham and Lazarus would have been excused if they had ended their paper with the classical exclamation of Archimedes; instead they merely say it seems worthy of clinical trial.

1. Graham, J. D. P., Lazarus, S. *J. Pharmacol.* August, 1940, p. 331.

Arrangements for notifying relatives of air-raid casualties are being modified so that members of H.M. Forces, including the associated women's organisations, as well as relatives at home will be informed if their relatives have been killed or injured. Postcards for this purpose are being supplied to hospital authorities and the public are asked to carry inside their national registration card a slip of paper with the name and official particulars of the sailor, soldier or airman to be notified. Hospital authorities will forward a postcard to the appropriate service department. The postcard will state whether an injury is slight, serious or dangerous, but sometimes it may not be practicable to send it till the patient has been transferred to a base hospital.

A Civil Defence (Employment) Order has been issued requiring all male personnel of the first-aid post and ambulance services who are employed on a whole-time paid basis to continue in that employment until their services are dispensed with. If over 30 years of age they will not be called up for military service during the current year. These men are thus placed on the same footing as men serving in the armed forces. The officer in charge of the service, who will normally be the county medical officer or medical officer of health, will determine when anyone's service is no longer required. As the order only applies to wholetime members it will not affect doctors in charge of fixed and mobile first-aid posts.

Special Articles

OF DEATH AND DYING

BY JOHN A. RYLE, M.D., F.R.C.P.
REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE; CONSULTING PHYSICIAN TO GUY'S HOSPITAL

To die is as natural as to be born. Of the latter process we are allowed no personal memory; of the former we have no chance to leave a record, and, if we had, the state of our consciousness during the hours or days preceding our demise would generally exclude all clear and useful observation. The death-bed clarities of fiction and the stage are seldom true presentments. Most of mankind, moreover, have small familiarity with the process of dying and the appearances of death in others, their experience being confined to phases of sad anxiety on behalf of a few of those near and dear to them and to the emotions of bereavement engendered by their loss. At the time they cannot be severely objective, and lack of medical training leaves them uncertain as to what the last state of feeling of the departed may have been. To doctors and nurses, to priests and soldiers alone is the opportunity given of a real familiarity with dying and with death, and of these only the first and the second can be accounted more or less trained observers and objectively interested. Writings on the subject even at their hands have not been frequent or informative.

As children are afraid of the dark and primitive races of the unknown, so the majority of men have walked in some measure of dread of death. Could we but teach them to be less fearful what a service to humanity we might render. Religion and superstition, so far from helping most men and women to peace of mind in the prospect of mortality, have persistently aggravated fear, finding in death itself a punishment for evil living instead of the peaceful, dreamless night that follows inevitably on life's day; inventing ideas of judgment, of purgatory and hell, without a shred or vestige of evidence in support of their inventions; concocting, as a bribe for better actions, a dubious comfort and reward for the elect by the offer of wings and halos and harps. Not the wages of sin but the peace that passeth all understanding is the rationalists' picture of the oblivion which follows toil and weariness, the decrepitudes of age, the pain of wounds, the weaknesses of fever and slow disease, the disillusion of failure; a peace, it seems to them, no less to be desired by those upon whom life has smiled kindly, a peace not be to rivalled or added to by any second innings of hypothetical existence.

Everything that we see or feel and experience with our senses, all our emotions of love, joy and content, as well as all the grades and varieties of pain and woe, disappointment and alarm, depend on the physiological integrity of a nervous system so intricate and a viability and reactivity of tissues in a chemico-physical sense so delicate, elaborate and perfect that we cannot conceive of the dead and disintegrating body as experiencing these sensations and emotions at all. We know that no stimulus which evokes these natural reactions of the living can evoke them in the dead, who are as clay. Nor, as logical and scientific beings, can we believe that, with the cessation of all the motor and sensory activities of life through the dissolution of the structures which subserve life, any other motor or sentient part of us remains to move and feel in the way that we have been accustomed to move and feel. For us, whether there be a spirit separate from sensation, thought and motion or not, death, in so far as we understand sensation, thought and motion, must mean arrest of activity and an oblivion not different from that which obtained before we left the womb. And so we do not or should not fear death or what follows it. And in this belief we should surely train our children, ourselves and the whole educable world of men.

But if past generations feared death itself or the aftermath of death, perhaps a larger proportion of moderns, with the waning of superstition and conventional religious influence, and with the constant near reminders of death in violent forms which war and aerial onslaught bring, have become imbued rather with the fear of dying. Perhaps at all times the fear of dying, prompted by the appearances of the injured and the sick and those in articulo mortis, has competed strongly or been confused with or excelled the fear of death itself.

* * *

It is well therefore that we should inquire whether dying is so much to be feared as men for the most part have assumed it to be. There are deaths from heart-failure and accident and cerebral hæmorrhage so instantaneous or swift, and others from various forms of coma so complete, that they can give no time or allow no faculty for apprehension or for any other uncomfortable sensation or emotion. Such deaths are commonly acclaimed as merciful. There have been numerous escapes from death in mountain or motoring accidents or similar circumstance in which the victims of a serious crash or fall, avoided or checked as they say "by a miracle," and resulting only in slight injury, have recorded that they felt no fear and had chiefly been conscious in retrospect of the quick reflex adjustments to save or to protect themselves. In sudden danger the protective reflex always tends to cancel fear. Some of our pilots who have been shot down and escaped by lucky crash or parachute may one day have something to tell us here. But what of the less swift demise of acute illness, of pneumonia or heart disease, of exhausting wounds or hæmorrhage? There are accounts by good observers, including medical men, who have been reclaimed from the seeming menace of death through causes such as these, and the story they tell is that when, to the bed-side watcher, they appeared in their greatest distress, with heaving chest and blue lips or parched mouths and exsanguine pallor, their actual state of consciousness was like a dream or a state of partial anæsthesia and that they knew little or no suffering. A doctor recovering from a bad attack of heart-failure described sensations during the most anxious period of his illness akin to a pleasant intoxication. Another old physician swiftly taken in a heart attack of which he had had some small warnings, oblivious of those around him, counted himself out like a referee with the fallen champion of the boxing-ring. A third with pneumonia remembered nothing between being taken ill and coming to life a week or ten days later with an ardent desire for breakfast. A colleague of mine, whom I attended in a serious pneumonia and who was always able to answer questions rationally at the time of the visits, had no recollection whatsoever of these visits afterwards. These gaps in memory must at least imply a considerable dimming of consciousness at the time of real or apparent suffering. Fever and shortness of breath can well imitate the twilight sleep of scopolamine and morphine, the effects and benefits of which we do not doubt. Most diseases accompanied by lack of oxygen or continued high fever may be considered to produce effects not unlike those experienced during the induction of an anæsthetic or under drug-narcosis. Many of the outwardly distressing or painful deaths are the sequel of shock, hæmorrhage or fever or some combination of these, all of which are capable of dimming consciousness with a dreaminess or delirium as effective sometimes as the precious gifts of the hypodermic needle. In a convoy of wounded men there are always those who are groaning with pain, but they are the minority and they are not always conscious in their groaning. There are others who have pain in plenty but whose courage and a cigarette keep them in good heart. And there are the majority whose pain is of a less severe order. Of those in the category of the dying, however, I should doubt whether more than a small proportion are fully conscious of their suffering.

For the blessed help of morphine we can never be too grateful. But have we medical men, I often wonder, spent enough time in reassuring the relatives of the moribund, not only about the effectiveness of our methods of giving ease, but also about the wonderful compensatory relief which nature allows for many a mortal hurt or illness? Touring a hospital ward to see some of the victims of a bombing raid with manifold and various injuries I noted that nearly all

were in sleep or something like it and that those probably destined to die were certainly neither in terror nor great pain. No, the harder sufferings fall to those who recover slowly or are incurable but live long. Of those who face an early death from illness or wounds the greater number do not know it. Sir William Osler, one of the wisest and most experienced of physicians, wrote—

"I have careful records of about five hundred death-beds, studied particularly with reference to the modes of death and the sensations of the dying. The latter alone concerns us here. Ninety suffered bodily pain or distress of one sort or another, eleven showed mental apprehension, two positive terror, one expressed spiritual exaltation, one bitter remorse. The great majority gave no sign one way or another; like their birth, their death was a sleep and a forgetting." *

* * *

It is interesting to inquire whether there be a physical awareness or sense of dying apart from the occasional intelligent acceptance that the hour is drawing near. There is in fact a sense of dying, a feeling of impending dissolution, the angor animi or meditatio mortis of medical writers, which is sometimes hinted at or described by patients with evident anxiety or horror. It is not, however, very common and it is nearly always a false witness. Sufferers from angina pectoris experience it in a small proportion of cases. It is far commoner in so-called vasomotor angina or Gower's syndrome, a purely nervous disorder affecting the heart and circulation, which accompanies certain states of physical and emotional ill health. It may also complicate serum-shock and bad attacks of vertigo. Some of its attendant physical effects remind us of the paralysis or "freezing" of the rabbit in the presence of the snake or stoat. I have never encountered a symptom akin to it in those who were in fact about to die.

It seems therefore that the physical processes of dying tend to eliminate not only the terrors concerning it which have been harboured in times of health but also much of the mental and physical distress which has, in imagination, given special cause for the apprehension; that dying may sometimes be a terrible or a painful experience, but that consciousness is more often mercifully clouded by the chemico-physical disturbances with which nature counters hæmorrhage, shock, the bacterial infections, the lethal wound and the failing heart; and that in some instances dying may even be a pleasant process.

If then death itself is not to be feared because it implies nothingness or oblivion; if dying is only rarely a painful or terrifying experience, except in anticipation and imagination and in respect of our sorrow at leaving or being left by those whom we love, what is there left for purely personal dread? Admitted the circumstances of illness and the idea of beautiful bodies shattered are hurtful things to all sensitive minds, but should we not whenever possible draw some comfort from the actualities of medical experience and thereby lessen the æsthetic hurt. Let us assure ourselves that for the victims dying is not so terrible a thing as we have been led to believe. It is often the witnesses who suffer the greater mental pain. Their suffering is largely, however, a matter of untutored sympathy, of imagining what others must be feeling and what they themselves may be called upon to endure. Acceptance of the assurances here outlined does not at all imply callousness. Apart from what has been related we have the accounts in the daily press of the courage and even cheerfulness of men, women and children who have fallen victim to the bomb or fallen debris, and of soldiers, sailors and airmen continuing to man their guns and planes when mortally wounded. These too should remind us that under such conditions body and feeling and will are not always so crippled by pain or fear as they might be presumed to be. To believe this detracts not at all from the incredible courage of man, which must always quicken our wonder and our sympathy. Sympathy in active and generous forms we cannot and should not withhold, but a purely subjective sympathy and unnecessary self-flagellation with imagined suffering are not only unhappy but useless things, and must serve to inhibit good endeavour and the preparation for it. In times like the present, furthermore, the fear of death and injury can be a spark to panic and so help the enemy.

* * *

Those are most alive to-day who are most confidently and whole-heartedly employed in military and humane activities, since action crowds out fear. And is it not better to die living than to live in the rehearsal of death? Those only may be considered dead and dying who nurture their angor animi or meditatio mortis, who shun healthy action for morbid thinking, or who hold that "the struggle nought availeth," that the fight for life and for a better mode of life and for the ultimate cessation of killing as a means of international policy is something not in their province or worth their while.

Those, on the other hand, whose lives are compounded of action and a faith in mutual aid need know no death, and if a bomb, a bullet or the bacteria of disease should take them unawares they will find, in all probability, that the phase of passing is something quite different from all imagined experience, from all that ignorance, fiction and superstition have made it. In their leave-taking from the green earth and from their friends they may or they may not, with the numbing of their senses, feel a fleeting wistfulness, but they will know no terror and no shame.

* From the Ingersoll lecture on Science and Immortality, given at Harvard University in 1904.

MALARIA CONTROL IN WAR-TIME

THE watchword today is to produce and export such essential commodities as rubber, tea and tin from our tropical Empire to the utmost capacity, and to obtain maximum efficiency a healthy staff and labour forces must be maintained. The report of the thirteenth meeting of the Ross Institute industrial advisory committee on Aug. 6 describes how in quest of these objects that intrepid and ever youthful pioneer Sir Malcolm Watson last year travelled 35,000 miles in Africa, India, and Ceylon investigating disease-control measures. The keynote of his success has been always to interest the layman in the mysteries of malaria and of hygiene in general, and to this end he has procured the publication of "Conservancy for Tea Estate Labourers in India," by Dr. B. A. Lamprell and Dr. G. C. Ramsay, and the "Handbook of Malaria Control," by Dr. R. Svensson. In Southern Rhodesia he has, at the suggestion of Dr. Peter Martin, the director of medical services, arranged for a contribution of £5000 a year for three years from the funds of the state lotteries for the control of malaria and bilharziasis. The E. L. Hamilton Fund has also provided £1500 to be used for future researches in the prevention of tropical diseases. The greatest achievement in malaria prevention is to be seen in the tea estates of Southern India and Assam, where it has been shown that a group of 18,000 people, as the result of reduced sickness, earned 100,000 more days' pay in 1938 than in the average of the previous ten years. Major C. S. P. Hamilton has done a real service in calling attention to the ravages of the eye-fly, *Siphunculina funicola*, in causing acute conjunctivitis, especially in Assam. The life-history of this insect indicates that it breeds mainly in the thatch of native huts. A special preparation of Malariol was lately needed for use in a country with peculiar climatic conditions, and it speaks volumes for the efficiency of the technical staff of the Ross Institute that Lieut.-Colonel George Macdonald, R.A.M.C., was able to solve the problem within three days. Within a week several hundred tons of this new mixture were handed over to the military authorities for mosquito control in tropical regions.

Sir Wilson Jameson, in his dual capacity of dean of the London School of Hygiene and Tropical Medicine and medical adviser to the Colonial Office, has outlined the now somewhat restricted activities of the school. The aim has been to provide short courses of instruction from two to six weeks for those who are to undertake civilian or military service in the tropics. It is hoped to begin the standard five-months' course in the early autumn. The instruction of the Colonial Medical Service also forms an important aspect of the work of the school.

The annual meeting of the British Orthopædic Association, which was to be held in Liverpool on Oct. 25 and 26 is cancelled, but it is hoped to hold the meeting at a later date.

Letters to the Editor

TREATMENT OF WAR NEUROSES

SIR,—In your number of Sept. 7 Drs. Bowlby and Soddy raise afresh an issue a quarter of a century old, an issue so important that I feel it my duty to support them fully with the evidence of my own recollections.

After writing several articles on the prevalence of hysteria in the Army—articles which show that I had already reached a dangerous facility in that removal of bodily symptoms which some writers still regard as the beginning and end of treatment—I was sent to Maghull in 1917 for a course of training in medical psychology, taking with me all the scepticism of a nineteenth century pseudo-materialistic upbringing. I found, nevertheless, that many clinical problems were made clear and a new world of understanding was opened up, and when, with a fellow trainee, I was sent to Birmingham to treat patients, I thought I had only to explain the psychological side to my colleagues and they would appreciate this aspect of medicine. But I found myself treated in a way that amazed and puzzled me. As a surgical specialist I had been given the credit of knowing my job, and treated with the ordinary decencies of army and professional life, but as a "neurologist" (my official title) I found that any Tom, Dick or Harry knew I was a credulous fool, at the mercy of a pack of liars and malingerers. The situation was identical with that described by Bowlby and Soddy, except that we could find no-one to turn to for support. My colleague broke down, but the development and utilisation of a pathological truculence (my own form of neurotic reaction) enabled me to endure eight months of professional outlawry.

Then I was transferred to Ewell and, to our common benefit, shared experiences with a small staff who were working along the same lines as myself. Once more I felt we had only to explain our methods and our colleagues would at least be interested, and when in April, 1919, the British Medical Association held its annual scientific and clinical meeting, with a section for war neuroses, I looked forward to it with keenness. But for nearly three hours the only references to a psychological view were abusive, one speaker referring to an obscene theory which had reached this country via America and been adopted by "certain psychologists, mesmerists, and psycho-analysts" against whose methods a warning should be issued. This emotional obscurantism was bewildering, when one had expected a scientific discussion of work made familiar by the writings of C. S. Myers, W. H. R. Rivers, William Brown, Stanford Read, David Forsyth, Elliot Smith and E. S. Pear. The Birmingham episode now fell into place as part of a general reaction against new ideas.

The speaker referred to above made quite clear that these cases had always been treated by neurologists, who were the proper people to treat them now. This was understandable. I remember, when a student, seeing a puzzling case which was cleared up and emptied of further interest when word was passed round "Head says it's functional." We pictured this great neurologist as able to identify, through his vast knowledge of the C.N.S., processes and combinations beyond the ken of ordinary people. But wrestling, unaided, for three years with hysterical patients had by now taught me that the neurologist, as such, had nothing to offer except diagnosis, and then only if his own specialty was concerned in the consideration of specific symptoms. If a neurologist takes the trouble to study psychopathology he may be recognised as an expert in the handling of psychoneurotic patients. If he does not take this trouble, then his claim to be an expert is an impertinence. In 1919 the weight of authority was shown by the exclusion of psychological speakers from the selection at the B.M.A. meeting. Elsewhere, description of the revival of memories in the treatment of war cases was greeted with "Poor fish; they're fooling him all right" or silenced with cries of "Yah; psychoanalist!" As a result of this, the method found no mention in our textbooks. Henderson and Gillespie, for example, give a chapter on the war psychoneuroses with no mention of it, though Drs. Sargant and Slater, psychiatrists from the Mecca of orthodoxy, the Maudsley Hospital, recently described it in your columns as an essential part of treatment.

Overt opposition faded away in the years after the war and a generation of psychiatrists grew up who appreciated their responsibilities in the understanding of the psychoneuroses. But the teaching of clinical psychology was still resisted in high quarters, and a superstition still remains by which the serious study of this subject is counted as a disqualification. Your reviewer of "Neuroses in War" fell a victim to this when he naively assumed that psychotherapists either know nothing about, or are not interested in, clinical descriptions. Apparently, too, the negative attribute of not being a psychotherapist gives access to wells of truth beyond the reach of the other poor boobs. His last-line reference to "these semi-universal reactions" suggests an inability to distinguish between honest-to-God fear and those pathological mental states that the writers in "Neuroses in War" were discussing. Sargant and Slater made this distinction quite clear.

There is now a recrudescence of kick-in-the-pants therapy and writers speak of the neuroses as *due to* unconscious wishes that are really desires to escape from danger or discomfort, or to acquire monetary gain. No-one familiar with my writings will accuse me of ignoring those factors; but there are so often other and more distressing features and an absence of these "unconscious wishes" that a man who would act upon the generalisation should not be allowed near a war sufferer. Psychotherapists know that for the last two years there have been many men who, suffering from experiences in the last war, had carried on under handicap—undiagnosed, untreated, and unpensioned—till the looming danger of war broke them down and they sought the help they should have received twenty years ago. Here is a case, the particulars of which are already known to your readers.

A lad of eighteen went through bloody experiences in the last war and showed behaviour which, studied retrospectively, indicated a neurosis (Lord, save me from the word; but I have to use it). He afterwards qualified in medicine and had started on a house appointment in an important provincial hospital when a typical phobia, almost certainly of war origin, interfered with the performance of his duties. A pain in the belly would have brought the surgeons round him with a zeal only to be described in zoological metaphor; the neurotic disability brought forth a request for his immediate resignation and kindly advice to give up clinical medicine. With the approach of this war he carried on A.R.P. with the efficiency of the overscrupulous obsessional, but under more and more stress, till the emotional significance of Hitler's advance into Poland brought about an episode by which he stood before judge and jury in peril of his life.

A recognition of his clinical state sixteen years earlier might have saved this tragedy, but thanks to the paralysing influence of prejudice and obscurantism his own profession failed him.

Great suffering, physical and mental, is inseparable from this beastly war; if we are to do our duty by the men fighting for us we must make sure that this issue is not squabbled over in holes and corners but brought out into the light of day.

London, W.1. MILLAIS CULPIN.

SIR,—To show that the attitude to the neuroses and their treatment in the present circumstances, as described by Drs. Bowlby and Soddy, is not limited to a single centre, may I present the following cases?

A young ex-soldier came during one of this week's night raids to a local first-aid post. He was in a state of extreme and uncontrollable fear with violent tremors. On the next day when he was referred to my department he told of being blown off a lorry in France by a bomb that burst near it. He sustained a fracture through the left elbow-joint. This was treated in England, but the concurrent neurotic condition was neglected except that it was made the reason for boarding him out of the Army. Hence his deplorable condition at the moment.

Another is the case of a soldier serving in the Tank Corps. This man was brought to me in a confused, dissociated, disorientated state, having been within 30 yards of a small bomb-burst in a recent night-raid. He has been three years in the Army. In the artillery he was said to be unable to

stand for long periods "because of an old empyema." He was transferred to the Tank Corps, where presumably he could sit. Here he had several accidents in which he received blows on the head. After each of these he was about a fortnight in hospital. The somewhat involved ætiology of this case seems never to have been worked out—presumably through lack of proper psychiatric advice—the case being treated by transfer from one unit to another.

The third case is a young employee of a firm whose premises were situated within an area which was set on fire in the big blaze of Sept. 7 in the East End. This man had volunteered for fire-fighting and had been sleeping on the premises and going on duty at each alarm, thus losing much sleep. On the day of the fire he was subjected to severe stress, believing himself to be cut off from safety by a wall of fire. He had stuck to his job for four hours when he received orders to get away if he could. He did get away with surprising ease. Then, free from immediate danger, he collapsed and was taken to hospital. There he was given two injections of a quarter of a grain of morphia each and various large doses of bromide. These failed to have any effect and throughout the night he screamed "Fire!" at each bomb-burst. The next morning he was discharged. He found his way across London and then collapsed and was brought to me. The second night, after proper treatment, he was able to tolerate the aerial bombardment, which was of considerable intensity, with equanimity. He was discharged cured on the third day.

As psychiatrist to a group of four hospitals in the London area I have been asked to see a number of psychiatric casualties at one of them only. Here they constituted a considerable percentage of all air-raid casualties received. One wonders why such cases should be absent from the other hospitals of the group.

St. Mary's Hospital, Paddington. GEORGE PEGGE.

NEUROTICS IN THE FORCES

SIR,—In your leader of Sept. 7 you make a case for the exclusion from the Services of the neurotic and potentially neurotic tenth of the fighting population. The case is presumably based on the principle that the limiting factor in the new warfare is not personnel but machinery. This statement, taken by itself, is probably true. A small force of superbly equipped fighter pilots seems able to keep a much larger number of slightly less well-equipped bombers at bay. The enormous static armies of Flanders have been replaced by much smaller intensely mobile groups of tanks and armoured vehicles. Even the floating fortresses, the giant battleships, may, as our destruction of part of the French fleet showed, be at the mercy of tiny motor-boats. Each of the belligerents has a far smaller supply of machines than of men. It is argued then that perfection in quality is no less important among the men who wield these machines than in the machines themselves. As a corollary, it follows that there is no place for the potential or patched-up neurotic anywhere in the fighting services. If the knowledge that neurosis is a pass-word to civilian life encourages the latent neurosis to become manifest, so much the better. The slightly smaller picked fighting force will be the more perfect.

Were it not for one important fact, this picture of the position would be a true one. It does not however take into account the time factor. It takes months to train a first-class airman and years to train a first-class sailor. The same presumably holds for the soldiers of a mechanised army. No amount of psychiatric pruning of recruits can hope to keep out more than about 10% of the potentially neurotic. If neurosis is to be deliberately encouraged, an enormous amount of crucially valuable technical skill and experience will be wasted. Further, potential neurotics may maintain first-class efficiency for many years.

No-one who has had experience of treating the neurotics of this war will disagree with you when you say that only a relatively small proportion will ever again make good fighting men. The real question is what to do with the majority who cannot be got back to 100% fighting efficiency. One school of thought favours their immediate return to civilian life. This undoubtedly cures most of them—for hysterical motivation appears to be all-important, even in the apparent anxiety states and reactive depressions. The great disadvantage of discharge as a method of treatment is the one indicated above. It puts a premium on neurosis and encourages the waverers to make no effort whatever to restrain their symptoms.

The soundest solution seems to be the establishment of rehabilitation camps to which service neurotics can be sent for the duration of the war once their period of active hospital treatment is ended. Here they should be engaged on work of national importance at service rates of pay without bonuses. The conditions of the camps should be rigorous but healthy and the discipline should be strict. Under such conditions, many patients would almost certainly make successful efforts to recover; while the knowledge that the ways out of the psychiatric block were either duty or the rehabilitation camp, but on no account civilian life, would be the biggest therapeutic and prophylactic step forward which service psychiatry could make.

Drs. Bowlby and Soddy cross swords with their neurological chief for describing neurotics as "skrimshankers" and encouraging "somewhat forceful treatment." The truth is surely that "skrimshanking" is itself a most important symptom of neurosis. It is merely translating into somewhat homely English the well-recognised hysterical motivation of the majority of war neuroses. Having myself tried "somewhat forceful treatment" I have reached the conclusion that it is almost valueless. The patients are more frightened of bombs than of me! If injustices are to be avoided and accurate prognoses made, detailed psychiatric examination of every war neurotic is essential (and this means a ratio of 30 impatients to one psychiatrist as a maximum). But I have yet to be convinced that prolonged psychotherapy is really any more valuable than "somewhat forceful treatment" in converting constitutionally poor material into fighting men.

London. STEPHEN TAYLOR.

THE VOLE BACILLUS

SIR,—Readers of the annotation on page 338 of your issue of Sept. 14 may be interested to know that we have carried out some experiments with the vole bacillus as an immunising agent in calves against bovine tuberculosis. The results are encouraging.

Nine calves were injected with cultures of the vole bacillus, some intravenously, some subcutaneously, some once and some twice. They were fed a virulent culture of bovine tubercle bacilli after intervals ranging from 21 to 175 days from the last injection. Post-mortem examinations were made approximately 6 months later. It was found that in some of the calves a single intravenous or subcutaneous injection protected fully against infection, and that in the other calves macroscopic lesions were only very slight and were confined to the glands adjacent to the alimentary tract. The control calves developed typical widespread tuberculosis.

A full account of this work is being published in the November number of the *Journal of Hygiene*.

T. DALLING,
Cambridge. A. STANLEY GRIFFITH.

TRANSPORT OF CASES OF FRACTURED FEMUR IN EXTENSION

SIR,—Under present circumstances it is undoubtedly an advantage to have as many as possible of the patients in a hospital easily transportable. For this reason many surgeons feel that the use of skeletal traction and a Thomas splint with a bent-knee attachment for the treatment of fractures of the femur [1] should be avoided if possible, arguing that this apparatus cannot easily be modified for transport without danger of redisplacement of the fracture and considerable discomfort to the patient.

The method here described is simple, safe, and renders transport almost painless. The apparatus required is:

1. A wooden block about 24 in. high nailed on a wooden base. The block should be about 6 in. wide and 2 in. thick, and the base should be as broad as possible and the width of a standard service ambulance stretcher.

1. See Armstrong, J. R. *Lancet*, 1940, 1, 957.

2. An elastic rope about 6 ft. long, made by rolling a 4-in. Elastoplast bandage transversely with the adhesive surface inward.

3. A roll of adhesive strapping.

To prepare a patient for transport the "stand" is slid on to the bed until the Thomas splint rests on top of the block and the end of the bent-knee attachment is in contact with its side. The splint and attachment are then lashed firmly in position with strapping. The height of the block necessary depends on the degree of flexion at the hip of the proximal fragment of the femur, and a stand should either be prepared for each individual case, or a variety of sizes should be kept in stock. The elastic rope is next passed through the Kirschner horse-shoe and round the end of the Thomas splint and drawn taut. At least two, and probably three loops of rope, each drawn taut, are necessary to maintain sufficient traction. When the rope has been adjusted and tied the weights previously used for extension are carefully cut free from the horseshoe, the cords between the Thomas splint and the overhead beam are divided, and the patient is ready for transport.

Extension is maintained by the elastic rope and with a little experience it is possible to judge the amount of tension applied. Roughly speaking three loops (six thicknesses) of a rope made as described when drawn taut will produce a pull of between 20 and 30 lb. If the upper ring of the Thomas splint is close fitting, and it must be emphasised that Thomas splints as issued to first-aid posts and field ambulances are fitted with a ring large enough to pass easily over a boot and trousers and are not intended or suitable for hospital use, the whole apparatus is stable when the stand is placed on a stretcher and the patient can be transported in comfort.

If the materials are kept by the bedside the patient can be prepared for transport in under two minutes, and while it is desirable that this preparation should be supervised by the surgeon the ward staff should be trained in the use of the method so that a patient can be evacuated on short notice at any time without danger or discomfort.

The only disadvantage of this method is that patients are so comfortable after transport in the apparatus that there is a temptation to leave them as they are. The elastic rope, however, tends to become slack after twenty-four hours, and should be replaced by traction using weights and a pulley as soon as convenient.

South Rauceby, Lincs. J. R. ARMSTRONG.

PLASTER

SIR,—Mr. Girdlestone's admirably practical paper on plaster-of-paris technique in your issue of Sept. 7 is opportune. At times such as these skill in the application of plaster splints is especially called for. It is deplorable that facilities for instruction in this country are so limited; little special training is available, and skill in application often leaves much to be desired. As far as our capacity permits, senior students and practitioners will always find us willing to give any help in our power at the Cripples Hospital. No fee is charged. We have 400 beds devoted to orthopædic conditions; the term "cripple" is construed in its widest sense, as far as our means permit, and cases needing plastic surgery are included.

At my private clinic, now largely occupied by Belgian crippled children who have been evacuated, similar facilities are available. There we have a further 120 occupied beds.

HENRY GAUVAIN.

Lord Mayor Treloar's Cripples Hospital and Morland Clinics, Alton, Hants.

A REINFORCED LOAF

SIR,—I should be grateful if the advocates of a reinforced loaf would tell us what *clinical* evidence they have that the health of our population is suffering from a deficient intake of vitamin B_1; for, if such evidence exists, I am afraid most clinicians have overlooked it, but if it does not exist why reinforce the loaf?

Devonshire Place, W.1. ROBERT HUTCHISON.

SIR,—I think Sir Ernest Graham-Little has misunderstood me. I did not state, nor did I imply, that "it is 'cheaper' to take the wheat germ out of flour, and later to add a synthetic-chemical preparation containing only one of its many valuable ingredients, than to retain the wheat germ intact . . ." I stated that if vitamin B_1 is to be added to white bread, then the synthetic vitamin will be used because it is cheaper than that obtained from natural sources. I agree that brown bread is superior in all respects to white, but as long as the public demand the latter, and as long as the financial interests of the milling and baking industries are put before the health of the nation, the population will still continue to eat mainly white bread. If the white loaf must be reinforced, then all those food factors removed in its preparation should be returned to it. These include vitamins A, B, and the whole of the B complex (including riboflavin, nicotinic acid, vitamin B_6 and pantothenic acid), vitamin E, iron, calcium and phosphorus.

Welwyn Garden City, Herts. F. PRESCOTT.

THE NURSE ANÆSTHETIST

SIR,—Addenbrooke's Hospital are having difficulty in securing the services of a competent resident anæsthetist. They point out that newly qualified men are often quite unsuitable for the position, and hint at the inadequate training in anæsthetics received by the student. With all this I agree. The presumption is that previous experience in the administration of anæsthetics, and hence a previous appointment as house-surgeon or resident anæsthetist, is a desirable if not an essential qualification for the post. Yet Addenbrooke's Hospital offer the princely salary of £130 per annum, a figure suggesting either that the hospital is in financial difficulties and is appealing to the charity of the professional man, or is providing merely a further example of the exploitation to which recently qualified men are subjected. Since the Royal Berkshire Hospital offered a salary of £250 per year the board has had no difficulty in securing the services of a medical man with the experience and skill in the administration of anæsthetics which both patient and surgeon have a right to expect.

Royal Berkshire Hospital, Reading. JAMES F. RICKARDS.

PROCAINE INJECTION FOR MUSCULAR PAIN

SIR,—At the Charterhouse Rheumatism Clinic Dr. Warren Crowe, Dr. Gutstein-Good, some others of my colleagues and myself have evolved a satisfactory method of eliminating pain referred from muscle (heterotropic) by injecting each tender site with 0·25% procaine. Since there is little or no bleeding the addition of adrenaline is unnecessary.

The muscles near to and above the joint implicated are systematically investigated by equal and firm pressure of the thumb or forefinger while the patient's eyes are closed. Meanwhile the patient's facial expression is carefully watched. If his expression does not change another point is submitted to pressure. If he winces, jumps or cries out when a spot is pressed, or if a visible spasmodic contraction of a band of fibres of the same muscle adjacent to the tender site takes place, a positive result is recorded. The latter effect is well seen in large muscles like the gluteus maximus, where if the tender site is found in its upper portion neighbouring fibres running obliquely from above downwards and outwards contract.

A row of tender points having been elicited the procedure is repeated, each point that is still tender being marked with a Dermatograph pencil. The points are then painted with an iodine pencil and injection is begun with a fine needle attached to a syringe holding enough solution to deal with the whole area mapped out. The point of the needle is entered slightly obliquely within the tender area and is pushed through the fascial envelope of the muscle. The needle is then moved in various directions and at varying depths until the patient signifies that the painful spot has been reached; this is usually below the fascial plane. The injection of 1–2 c.cm. of the procaine solution is then given. The process is repeated until all the tender spots have been injected.

Pain and tenderness diminish rapidly, and provided that all the tender points have been found and dealt with they do not recur. In some cases fresh points will be found and treated in the same way at the next visit. In a few cases pain is felt at the site of injection for up to 48 hours.

Harley Street, W.1. J. F. HALLS DALLY.

Parliament

IT seems only the other day that the criticism was heard at Westminster that secret sittings were becoming too common. The view was strongly urged on the Government that Parliament should only sit in camera on comparatively rare occasions. But circumstances alter cases, and it is perhaps symptomatic of the changed conditions that three secret sessions have been held in a week in the Commons and two in the Lords and not a voice of protest has been raised. The Grand Inquest of the nation has had weighty matters to discuss, and by common consent such discussion could have little meaning or purpose if it was made public to the King's enemies.

The Prime Minister prefaced the secret session on Tuesday last week with a short but encouraging speech. Mr. Churchill owes a large part of the national confidence in his leadership to his outspoken frankness. He points with unwavering certitude to the victory ahead, but he has never held out hopes that it could be easily won. In his latest speech he warned Parliament that enemy preparations for invasion steadily continue and emphasised the necessity of constant vigilance. It was revealed that during the first half of September about 2000 civilian men, women and children had been killed by aerial bombing attacks, and about 8000 wounded. Four-fifths of these casualties were Londoners. Many hospitals and churches and public monuments had been damaged, but the injury to our war-making capacity had been surprisingly small. The A.R.P. organisation had proved its efficiency and Mr. Churchill paid a well-deserved tribute to all branches of the personnel for their discipline and devotion to duty.

Since the return of the British Expeditionary Force from France the Army Council have been considering reports on the work of the Auxiliary Territorial Service, in which over 30,000 women are enrolled for military duty of various kinds. The plans for reorganisation, which in some directions affect the Women's Royal Naval Service and the Women's Auxiliary Air Force as well as the A.T.S., are not yet complete, but Mr. Eden was able to indicate various important changes which have been approved by the Army Council and are being brought into effect at once. In the first place, an A.T.S. council is being formed with the director of the A.T.S. as president. The council will include a woman doctor attached to the staff of the Director-General of Army Medical Services who will be responsible for the health and general welfare of the A.T.S. The general purposes of the council will be to facilitate promotion on the recommendation of immediate superiors with personal knowledge of candidates; to improve technical training; and to provide more fully for the health and welfare of all branches. Welcome readjustments are already being made in the feeding arrangements for the A.T.S. The normal type of soldier's ration having proved too heavy for women in some respects and deficient for women in others, a new scale is being introduced. The main changes are: a slight reduction in the heavier foods such as meat, bacon and bread; a supplementary ration of eggs, 50% extra milk, fruit (fresh when possible), and a higher scale of fresh vegetables; and the supply of a cereal and a cup of chocolate at breakfast.

QUESTION TIME

Paratyphoid in Lancashire

In reply to Mr. RHYS DAVIES, Mr. M. MACDONALD, Minister of Health, stated: During the first eight months of this year 233 cases of enteric fever have been notified in Lancashire. The information received indicates that the disease is mainly paratyphoid fever. There have been a number of outbreaks, but none of them considerable. The largest numbers have been in Liverpool, Manchester, Chadderton, Farnworth and Bolton. In spite of careful investigations the exact sources of the outbreaks have not been traced, but there is little doubt that the causes of infection were articles of food contaminated either by a carrier or an ambulant person suffering from the disease. There is no evidence that infection has been conveyed by water or milk or associated with changes in population. The incidence of enteric fever in Lancashire has not been greater than in the country as a whole.

Treatment of War Neuroses

Sir ERNEST GRAHAM-LITTLE asked the Minister whether he was aware that during and after the last war advances resulting in now well-established therapeutic procedures were made in the psychological treatment of war neuroses; that at the Royal Southern Hospital, Liverpool, working under the Emergency Medical Service, two medical officers, because of the obstruction they had encountered in applying these methods, had resigned as a protest against the attitude, both of the director of the unit concerned and of the consultant adviser in neurology of the Ministry; and would he cause full inquiry to be made as, otherwise, these methods would encounter a setback, psychiatrists would be discouraged from undertaking these posts and the recovery of patients suffering from these neuroses would be gravely prejudiced.—Mr. MACDONALD replied: I am aware of the advances made during and after the last war in the treatment of the war neuroses, but am informed that the best method to be adopted in individual cases is still uncertain. I am informed that there have been differences of opinion between the two medical officers referred to and the director, but am advised by my consultant advisers that the methods applied by the director are such as to secure proper facilities for treatment of the service and civilian patients coming within the emergency scheme. I should therefore not be justified in intervening.

Deaths from Tuberculosis

In reply to a question Mr. MACDONALD gave the following provisional figures concerning deaths from tuberculosis (all forms) registered in England and Wales.

	Males	Females	Total
Last three months 1938 ..	3480 ..	2650 ..	6130
First " " 1939 ..	4523 ..	3503 ..	8026
Last " " 1939 ..	3664 ..	2533 ..	6197

Control of Dairy Products

Mr. R. BOOTHBY, parliamentary secretary to the Ministry of Food, informed Colonel W. H. CARVER that the manufacture of and trade in butter, cheese, and condensed milk were already controlled, and a similar control for milk powder was under consideration.

Vitamin Biscuits

Mr. G. MANDER asked Mr. Boothby whether he would consider the advisability of arranging for the production of a biscuit containing the minimum daily requirements of each of the 10 most important vitamins, together with such minerals as calcium, iron, and copper for distribution to the public on very reduced terms.—Mr. BOOTHBY replied: The Minister does not consider that the introduction of a special biscuit is necessary at the present time, but the proposal will be given further consideration should circumstances change.

Wholemeal Flour

In reply to Sir ERNEST GRAHAM-LITTLE Mr. BOOTHBY said no stocks of wholemeal flour, beyond ordinary trade stocks, are being carried, for the reason that wholemeal flour deteriorates rapidly in store. Exact figures of the quantity consumed are not available, but the proportion lies between 5% and 10% of total output. Wholemeal flour is available at the same price as white flour and the high consumption of the latter appears to afford sufficient evidence of the public's preference.

Malnutrition on Tyneside

Mr. DAVID ADAMS asked the President of the Board of Education whether his attention had been called to the wide discrepancies in the assessment of malnutrition among school-children in different Tyneside areas revealed by a recent investigation by Dr. D. M. Goodfellow of Newcastle; and whether, in view of the danger of increasing malnutrition among school-children as a result of the present war, he would take immediate steps to have assessments of nutritional standards brought into line throughout the whole country, so that a reliable knowledge of the facts might be obtained.—Mr. HERWALD RAMSBOTHAM replied: I am aware that there are considerable differences in the percentages of undernourished children found by school medical officers in the various Tyneside areas, though the differences shown by the returns for 1939 are not so great as in the returns for earlier years, on which Dr. Goodfellow's criticisms were based. Such

variations are, to some extent, real, and due to differences in the social circumstances of the areas, though they are no doubt in part due to differences in the standards adopted by the school medical officers. Where the returns appear to indicate that the medical officer's standard differs materially from that usually adopted, it is the practice of the board to arrange for a visit to the area by one of their medical officers for the purpose of discussing the matter with the school medical officer and, if necessary, conducting a sample nutrition survey in a group of schools.

Obituary

RICHARD TANNER HEWLETT

M.D. LOND., F.R.C.P., D.P.H.

Dr. Tanner Hewlett, who died in London on Sept. 10 at the age of 75, was associated all his life with King's College, London. He was a student there, and served his time in resident appointments at the Portugal Street hospital before turning to pathology and merging in his own department the courses both of bacteriology and public health. He thus became one of the pioneers of pathology in the service of medicine and by word and example put a great host of students and assistants on the high road to an outlook on medicine in which pathology played a living part.

Elliott & Fry.

Richard Tanner Hewlett was born in 1865, son of Richard Hewlett, solicitor of Stroud, Glos. He entered the medical faculty of King's College in 1883, gaining scholarships at each stage of study and qualifying M.B. Lond. in 1890 with honours in forensic medicine. His ability and care in investigating the causes of disease were soon noticed, and in 1892, on the resignation of W. K. Dale, he was appointed lecturer on comparative pathology and bacteriology at the college. In 1901 he succeeded E. M. Crookshank in the chair. Three years later the department of public health which had been under the direction of W. R. Smith was transferred to his department, and he became recognised as a leading expert on the bacteriology of public health. Much of his work was embodied in official reports. Most of this time he was also bacteriologist to the Jenner (now the Lister) Institute. As physician to the Seamen's Hospital at Greenwich he kept in touch with the clinical side of medicine. He also lectured on bacteriology at the London School of Hygiene, and after retiring from King's in 1925 he was soon appointed hon. secretary to the Royal Microscopical Society with which he identified himself in his later years.

Hewlett's clear thinking and easy diction made his lectures as instructive as they were popular. This again accounted for the popularity of his very readable and accurate "Manual of Bacteriology," which ran through nine editions. His "Pathology (general and special) for Students of Medicine" was the ideal student's textbook of the time. Pathology was then less bounded by rigid limitations than other subjects with which medical students had to deal, and Hewlett took vital pathology as his standpoint, not simply the material of the post-mortem room and pathology museum. This book ran through eight editions in Hewlett's hands; in the ninth edition he had the collaboration of Dr. James McIntosh when the book started on a new lease of life. On the wider application of bacteriological principles he based the Milroy lecture of 1909 on disinfection and disinfectants, and our own columns testify to his practical interest in current public-health problems. In the earlier days of the last war he was trying with A. T. Nankivell to solve the problem of diphtheria carriers by injection of endotoxin. He closely examined the provisions of the Milk and Dairies Bill in the light of the bacterial content of milk.

Hewlett had an attractive personality and moved freely and easily with colleagues and students. J. M. writes: "I first met Hewlett many years ago when still a student, since when I have been in close touch with him and latterly acted as collaborator. Through all these years I have been struck like the rest of his friends by the wide knowledge he possessed behind his quiet and unassuming personality, a knowledge which he was always ready to place at the disposal of others. Latterly, in spite of the fact that his life was burdened with a painful affliction, his cheerfulness and friendliness remained and will remain for many of us as a happy memory."

Prof. William Bulloch, from personal knowledge over 45 years, adds this tribute: "Hewlett lived through the golden age of bacteriology and by his studious habits made himself master of his subject. His leanings were towards public health, and in his early days he published a good deal of research work all of which was of high standard and always accurate. After he left the Lister Institute he did a vast amount of teaching work and became widely known through his excellent textbooks on pathology and bacteriology. He had a facile pen and contributed the exhaustive articles on diphtheria, botulism and whooping-cough to the M.R.C. System of Bacteriology. When any author did not complete an article to the satisfaction of the editor, Hewlett was always the stand-by who could take it in hand and do it properly without losing a friend or making an enemy. Hewlett retained his interest in his subject to the end of his life, and his last paper shortly before he died was an interesting account of the centenary of the Royal Microscopical Society. I never saw Hewlett in a hurry. He was a quiet normal man devoid of personal thrust. He was contented and interested in his science for its own sake. He was therefore rarely chosen for preferment, and his virtues were known to the few rather than to the many. He led a useful life as a serious student, and will long be affectionately remembered by all who knew him."

JOHN JAMES McINTOSH SHAW

M.C., M.D. EDIN., F.R.C.S.E., F.R.S.E.; COLONEL, R.A.M.C.

In the spring of this year the War Office asked the president of the Royal College of Surgeons of Edinburgh to name a consulting surgeon to the British Army in the field. The president took counsel, and J. J. M. Shaw was chosen for this post. It would have been difficult to have made a better choice. Shaw left his work in Edinburgh and his charge as full surgeon in ordinary to the Royal Infirmary, to which he had been promoted only a few weeks previously, and disappeared into that land of shadow in which we live today. The first report from him after his arrival at the medical headquarters of the British Army somewhere overseas was that he was fit, happy and contented in the responsible work entrusted to him. But later a warning came home from his physician colleague, an Edinburgh man like himself, that grave anxiety was felt as Shaw had fallen a victim to an attack of acute bacillary dysentery, and soon there followed the news that he had died on active service.

Again the Edinburgh medical school has lost a surgeon in his early fifties, but one who already had made a world-wide reputation. His career as a student was very like the man of later years. Born to command, he came quickly and without effort to the front. In the university battery he rose to the rank of sergeant. He was elected president of the students' union and of the university athletic club. He was one of Sir Thomas Fraser's residents, a blue ribbon very keenly prized. Like so many of his generation, his career was linked with the last war. Its outbreak found him in London, and he proceeded with the original Expeditionary Force

to France in 1914, and served there as a surgeon in a casualty-clearing station until the armistice. When peace came he returned home and was attached to Bangour Military Hospital, near Edinburgh, where he did orthopædic and general surgical work, and it was there he met his wife, daughter of the nearby estate of Wallhouse. His next move was to London and to Sidcup, where he became one of the foremost plastic surgeons in this country. Later, in this capacity he returned to Edinburgh and served in the Ministry of Pensions Hospital at Craigleith. His appointment to the hospital at Leith, his native city, and later to the Royal Infirmary of Edinburgh as an assistant surgeon, soon followed. He had outstanding qualities as a plastic surgeon and worked miracles of restoration for those deformed by burns, birthmarks and congenital abnormalities, but somehow these cases did not appear to have the same appeal for him as the work he had done for the disfigured soldier. And so it came about that he, who many of us classed as one of the two foremost plastic surgeons of the British Empire, gradually gave this branch of his work a secondary place and enlisted in the campaign against cancer. His approach was characteristic and statesmanlike. As one of a team under Sir David Wilkie, he undertook research work on the effect of radium on the growth of tissue, and he assumed control of the Beechmount annexe of the Royal Infirmary, which was reserved for cases of malignant disease. The ground having been prepared, on his initiative the Cancer Control Organisation for Edinburgh and the South East of Scotland was launched at a meeting of representative citizens to whom Mr. Shaw explained the plan of campaign. On the educational side popular lectures were given in which the importance and efficacy of early treatment were dwelt upon. Shaw himself and certain of his surgical colleagues also gave clinical lectures and demonstrations to general practitioners. This organisation has supplemented the work of the hospitals in many ways—in paying the fares of patients from the country, by organising and subsidising a follow-up service, and by encouraging research in various aspects of cancer. Finally it sponsored the founding of a special hospital for the investigation and treatment of cancer.

The practice of surgery concerns intimately the treatment of the individual patient, and in operating on him the skill, courage and resource that Shaw displayed was admired by us all. At the same time, to those who knew him best it was clear that when treating the individual case his mind never lost sight of the larger problem as it affected the community to which the individual belonged. Thus as time went on he was elected to the council of various medical organisations in London and Edinburgh, the most recent being his appointment to the university court of Edinburgh University. Some of us felt that in him we had one whose destiny was to become a leader in the academic and professional world of medicine. Not ripe in years and heaped with the rewards that service to the community brings with it has Shaw gone to his rest. He has fallen in his prime with much achieved and the promise of great things to come unfulfilled.

H. W.

EDWARD EMANUEL LENNON

F.R.C.P.I.

Dr. Edward Lennon died on Sept. 10 at his home in Enfield, co. Meath, at an advanced age. He obtained the licences of the Irish Royal Colleges in 1883, and was elected a fellow of the Royal College of Physicians of Ireland in 1892. He early received an appointment on the staff of the Meath Hospital, Dublin, where he had trained, and for over forty years filled the post of physician there. He often examined for the Royal College of Physicians, and was vice-president of the college for a time. His reputation as a practical teacher, was high and he had a large private practice. Though a careful clinical observer, he published little. He was much interested in sport, and for a time kept racehorses with fair success. He loved a country life, and for many years had had a country house some thirty miles from Dublin, where he spent his leisure, and when he retired from his hospital and private practice some years ago he went to live there.

Notes, Comments and Abstracts

MANY AT A BIRTH

From a monograph [1] on human multiple pregnancy, shortly appearing in America, by ALAN F. GUTTMACHER, *M.D., associate professor, department of obstetrics, Johns Hopkins University.*

TWO-EGG twins either have separate placentæ or a single fused placenta with a four-layered partition wall formed by two amnions and two chorions (dichorionic). Owing to fusion of the two chorions, the partition wall may frequently appear to have but three layers; 55% of two-egg twins have separate placentæ and 45% a fused single placenta. Through intravascular injections, definite anastomoses have been demonstrated between the blood-vessels of fused dichorionic placentæ, although far less commonly than in monochorionic specimens. The anastomosis between the placental vascular trees of twins creates what was termed by Schatz a "third circulation." According to Lillie in the United States and Keller in Germany this third circulation between opposite sexed twin cattle fœtuses is the cause of the freemartin, in which the heifer twin is born with an undeveloped atrophic reproductive tract, while the bull co-twin is normal. It is supposed that hormones from the developing testis gain access to the blood of the co-twin and inhibit the growth of the female's sexual organs. The freemartin in cattle may be the basis for the statement, oft repeated by laymen, that one of a pair of human twins is sterile. I know of no basis in fact for this assertion. The derivation of the word "freemartin" is obscure. Sir Francis Galton suggested that the sterile heifer was ready or free to be slaughtered on Martinmas, St. Martin's day. The effect of this "third circulation" upon human twins is not fully known; however, there are two pathological types of twin embryos which are probably related to it—acardius and fœtus papyraceus.

ACARDIUS

In the placental vascular anastomosis between monochorionic twins the blood from the arterial capillaries of one runs into the venous capillaries of the other. Usually interchange of blood occurs equally, so that each twin is transfused with the same amount of blood from his co-twin that he in turn has given him. This is spoken of as symmetry between the two circulations. However, with asymmetry of the "third circulation" richer and more diffuse vessels lead to one than return from the other. This may eventuate in the death of one fœtus, or, according to Schatz, the atrophy and absorption of the heart and upper body of the less well-nourished twin, leaving only its lower extremities, a so-called acardia. Occasionally the acardia is represented by a mere shapeless mass of tissue—acardius amorphus. Finally, both the acardia and the acardius amorphus are pure parasites to which blood is pumped by the heart of the normal co-twin.

FŒTUS PAPYRACEUS

Fœtus papyraceus, or compressus, is the mummified, parchment-thin, compressed, dead co-twin of a normal twin. One twin not infrequently dies between the second and sixth month. The amniotic fluid may then be absorbed from this sac, and if so the dead fœtus is squeezed and thinned between the fluid full sac of his normal co-twin and the uterine wall. Finally, it is extruded with the placenta of its normal co-twin as a wafer-like form of an infant, enshrouded in the folds of the fœtal membranes. A fœtus papyraceus is usually monochorionic and probably often caused by inequalities of the third circulation; it may, however, occasionally be dichorionic. Here the cause can hardly be the third circulation, since it is too incomplete in dichorionic placentæ to be very important, and so we are forced to blame nutritional or mechanical factors. Triplets have been described in which there is one normal child plus two fœtus papyraceus, or one acardia and one fœtus papyraceus.

1. An extract from this work appeared in the *Lancet* of Aug. 10, p. 183.

It may be necessary to postulate a third type of twinning, in order to explain the rare specimens of a male and female twin arising from a single graafian follicle. Greulich reports the autopsy of a woman in the fifth month of pregnancy with a male and female twin. Serial sections of both ovaries showed only one corpus luteum. A patient died of postpartum eclampsia at the Johns Hopkins Hospital, after having given birth to a boy and a girl. Several routine sections taken at different levels from each ovary showed only one corpus luteum. There are three possible explanations for such cases. One possibility is the rupture of a binovular graafian follicle with the release of two ova and, of course the formation of but one corpus luteum. While reporting the mirror-imaging of an identical eye anomaly in different sexed twins, Levin presents a second theoretical explanation. He thinks that twins derived from one egg may be of opposite sex, if chromosomal mutation in one causes it to undergo sex reversal early in its genesis. In such an instance we should also have one corpus luteum and yet twins of opposite sex. A third possibility is Bischoff's old theory of the fertilization of a polar body by one spermatozoon and the fertilization of the ovum by a second. If the polar body were derived from a non-reducing division of the ovum it would have chromosomal constituents identical with the ovum. Such twins would therefore be monozygotic in respect to maternal inheritance and dizygotic by paternal inheritance. If however the polar body were from a reducing division of the ovum the twins would be normally dizygotic. Despite the fact that polar bodies are regarded as abortive eggs, their fertilization has actually been observed in echinoderms and molluscs. Most biologists believe that such an occurrence is extremely unlikely among the more complicated organisms such as mammals. Even so it remains a possible explanation for opposite-sexed twins from a single graafian follicle.

MEDICAL WAR RELIEF FUND

THE relief of distress arising from the war among medical men and their dependants is clearly beyond the powers of the existing benevolent funds, and it is good hearing that a committee has been formed to collect moneys from those of our profession who have not been hard hit by the war and distribute them to those who have. The committee consists of the presidents of the Royal Colleges, the officers of the British Medical Association with the chairman of its Charities Committee, and the president of the Royal Medical Benevolent Fund. Help will take the form of grants or loans, and will be given in full coöperation with the other medical charities, so that overlapping will be avoided. Contributions of any amount should be sent to Dr. G. C. Anderson, hon. treasurer of the Medical War Relief Fund, at B.M.A. House, Tavistock Square, W.C.1. Applications for assistance should be made to the hon. secretary of the fund at the same address. This is a cause which should meet with a generous and immediate response, and we understand that £2700 has already been received.

BLOOD TRANSFUSION SERVICES

AT a meeting of the Socialist Medical Association of Great Britain on Aug. 23, with Prof. J. R. Marrack in the chair, Dr. R. S. Saxton described some of his extensive experience of blood-transfusion in Spain.

He regretted the slowness with which modern advances in technique, such as the use of the pressure ampoule, were being adopted in this country, but welcomed the increasing conversion of stored blood into plasma. A very low hæmoglobin, he pointed out, was no bar to survival in a case of chronic anæmia, so that the important factor in the treatment of hæmorrhage and shock was the replacement of fluid. Dried plasma would serve this purpose as readily as whole blood, was more portable and would keep indefinitely at room temperature. The agglutinin content of the quantities at present used—equivalent to 200 c.cm. of plasma—were not dangerous, but large quantities might be. Group AB. plasma avoided this danger but the supply was limited to 3% of the whole stock. The shortage might be overcome by mixing groups A and B prior to separation of the plasma and thus provoking adsorption of the agglutinins. Professor Marrack interpolated a warning that this procedure would add to the risk of infection; later he mentioned two other pitfalls, distilled water and rubber tubing, either of which might convey a fatal infection.

Dr. Leonard Crome, who was responsible for organisation of transfusion services in Spain, advocated the increased use of dried plasma in order to provide adequate transfusion material for all casualties. Nurse M. C. Darton, who had given many transfusions in Spain, said that in heavy bombing an insufficient number of doctors would be available to give transfusions which would have to be delegated to nurses trained in the work. Not enough opportunities were being given for training here. The pressure ampoule, thanks to its great simplicity, was especially suitable for use by nurses.

Mr. Somerville Hastings thought donors reluctant to volunteer because so much blood was wasted by the present system, but Dr. Joan McMichael said that there was no wastage as far as the transfusion centres were concerned, and that she had met with an excellent response to an appeal for donors in factory areas, some 50–70% of the population having responded. In one factory 3000 had enrolled. Mobile transfusion units were being formed. She mentioned that 24 hours in the ice chest killed all spirochætes, but that it was essential to have a Kahn or Wassermann reaction done on blood used for direct transfusion.

MAKING THE DOCTOR GO ROUND

PATIENTS think, quite rightly, that the doctor is there to look after them, and doctors with equal justice sometimes find patients expect a good deal. In war-time it is easy for a patient to expect too much without perhaps realising that he is going beyond his usual standard. A doctor in the West Country who found his patients erring in this way from lack not of good-will but of imagination, recently sent us a small handbill headed "How to Help Your Doctor," which set out the following points:—

1. Send messages for visits before 10 A.M. Rationed petrol, blackout conditions and increased costs demand avoidance of duplicated journeys.
2. Avoid night calls and Sunday visits when possible. Spare your Doctor—call him early in the day.
3. Attend the Surgery whenever possible. Come early!
4. Always bring a bottle or container.
5. In a message, state as clearly as you can, the nature of the complaint, duration of illness, its severity, and the degree of urgency of the call. Exaggeration may deprive a patient who is more seriously ill of gravely needed priority of attention.
6. Every human effort will be made to maintain the highest degree of service and efficiency. Your thoughtful coöperation is essential.

The idea is, of course, extremely good, and many doctors will feel that some such gentle hint to patients will not come amiss. On the other hand one can picture the West Country farm labourer—mentally acute in his own field, keenly alive to the needs of the pig and a close reasoner about turnips—scratching his head a little over the doctor's leaflet and even withholding his thoughtful coöperation through pure bewilderment. Might not something more akin to the vernacular get better results, e.g.:—

DO YOU WANT TO HELP YOUR DOCTOR IN WAR-TIME?

If so:

1. Send messages *before* 10 *a.m.* if you want him to visit you. Remember that his petrol is rationed and that his travelling expenses have risen so he doesn't want to cover the ground twice or more on one day, especially during the blackout.
2. Avoid night calls and Sunday visits whenever possible.
3. Come to the surgery if you can rather than ask for a visit and *come during surgery hours*, the earlier the better.
4. Bring a bottle if you have one and return all empty bottles.
5. In a message state as clearly as you can what is wrong and how long the patient has been ill. Don't exaggerate or the doctor may have to neglect somebody more seriously ill in order to hurry to you.

Mr. G. R. GIRDLESTONE has been appointed honorary consulting orthopædic surgeon to the Ministry of Pensions.

PROGRESS

FOR several years the New York Academy of Medicine has organised lectures to the laity on various subjects and they have now published those which were delivered in 1938 and 1939 (The March of Medicine. Humphrey Milford, Oxford University Press. Pp. 168. 13*s.* 6*d.*). The subjects chosen have an interest for any citizen who is concerned to know something of the progress of medicine from its early beginnings in witchcraft and magic to its present scientific outlook. All were delivered by distinguished speakers. The later chapters deal with the romance of modern surgery, the story of insanity, and the hard lot of psychiatry which is designated, perhaps with a touch of morbid self-pity, as the Cinderella of medicine. In the earlier chapters, Dr. Walter C. Alvarez of the Mayo Clinic deals with the connexion between traditional folklore and modern medicine and Dr. S. V. Larkey, the librarian of the Welch Library at the Johns Hopkins University, contributes an article on health in Elizabethan England, in which he traces the beginnings of the conscious struggle to improve the public health. The Elizabethans were far from being as careless about cleanliness and sanitation as we are apt to fancy. A commission on sewers was appointed as early as the fifteenth century, and there were penalties for polluting streams; brewers and tanners were required to use cesspools. Overcrowding was recognised as a cause of epidemics; Elizabeth, in 1580, proclaimed that "where there are such great multitudes of people brought to inhabit in small rooms" it must follow that a plague or popular sickness would "spread itself and invade the whole city and confines, as great mortality should ensue to the same"; and she forbade the building of any new houses in the London area, or the subdividing of existing houses into tenements. Dr. Larkey gives an account of St. Bartholomew's Hospital at this time. It had been revived, after the Reformation, by the City of London with the aid of a grant from Henry VIII and was directed by a board of governors. The sisters were under the charge of a matron; they were not allowed in the wards after 7 P.M. in summer and 9 P.M. in winter, and were charged to avoid light, wanton and foolish words, and to detest scolding and drunkenness. The beadles in their walks through the city were to be on the look-out for sick persons and report them to the almoner so that provision could be made for them; and they were to see that former patients were not begging in the streets. Dr. C. K. Drinker, professor of physiology at Harvard, bases a lecture on the diary of his great-great-grandmother, Elizabeth Drinker, living in the Philadelphia of the last half of the eighteenth century. She was a Lady Bountiful, treating the minor illnesses of her friends and dependents with energy and confidence. Some of her recipes, though based on accepted practice at the time, appear sufficiently perilous in retrospect. To a bruised foot on which the skin was broken she says "I apply'd a cataplasm of cow-dung—which I hope will not hurt it." A very bad stye she cured with "rotton appel" and when "our Thomas" ran a nail in his arm she remarks "I have dressed it with Rabits fat, it does not appear bad but 'tis best to take care." This sort of thing makes one wonder whether posterity will gasp and shake their heads over our temerity with the drugs and cataplasms of our own day.

Medical News

University of Leeds

At recent examinations the following were successful:—

M.D.

C. L. Davidson (with distinction).

FINAL EXAMINATION FOR M.B., CH.B.

Part II.—J. Dawson (second-class honours); J. A. Aylwin, N. K. Barber, Katharine M. Barran, Elizabeth Bate, J. H. G. Brodribb, G. H. Cooper, D. M. Davies, N. S. Daw, Beatrice M. Downie, J. Firth, K. I. Heap, A. G. Hick, G. B. Hirst, J. R. MacLeod, J. S. Mather, R. Morley, R. G. Paley, D. L. Shaw, L. M. Sherwood, A. A. Smith, G. Snowden, T. W. Sutherland, R. Varley, and M. G. Wilson.

King's College, London

The new session of the faculty of medical science of this college, located until lately at Glasgow, will open at the medical school of the University of Birmingham on Oct. 9.

Casualties

The following casualties are reported:—

Wounded.—Surgeon Lieut.-Commander D. P. Gurd, M.B.Belf., R.N.

Missing.—Surgeon Lieutenant F. H. Williams, L.M.S.S.A., R.N.

Prisoners of War.—W.S. Captain J. C. Cameron, M.B., R.A.M.C.; Major B. B. Hosford, M.D.Lond., R.A.M.C.; Lieutenant D. G. Howatson, M.R.C.S., R.A.M.C.; Lieutenant A. R. T. Lundie, M.B. St. And., R.A.M.C., and Lieutenant F. R. R. Martin, F.R.C.S., R.A.M.C.

Queen's Hospital, Birmingham

On the recommendation of the casualty hospital subcommittee the Birmingham Hospitals Council has decided that Queen's Hospital shall be used as a fracture and traumatic hospital and rehabilitation centre. The subcommittee consider that 280 beds are needed, and in the first instance 110 will be provided. The hospital will be managed by an independent board.

A.R.P. Etceteras

The Ministry of Home Security has announced that the larger public air-raid shelters are to be fitted with tiers of bunks, and that chemical closets and drinking water are also to be provided. Millions of earplugs are to be distributed to civilians. This programme will first be put into effect in London.

Messrs. ALLEN and HANBURYS have put on the market a sterile non-adherent medicated gauze called Nonad Tulle. It is impregnated with balsam of Peru and vitamins A and D in petroleum jelly. It is available in boxes of 10 pieces 4 × 4 in.

Appointments

BAKER, J. K., B.A.Camb., M.R.C.S.: senior house-officer at the Mount Vernon Hospital, Northwood.

BOND, S. A., M.B.Glasg.: res. asst. M.O. at Mayday Hospital, Croydon.

DICKSON, A. M., M.B.Manc.: res. asst. S.O. at Withington Hospital, Manchester.

DINGLE, W. T., M.D.Manitoba, M.R.C.O.G., res. asst. M.O. at Southlands Hospital (E.M.S.), Shoreham-by-Sea.

GLASSMAN, MORRIS, M.D.Toronto: R.S.O. at the Royal South Hants and Southampton Hospital.

JANDA, G. S., M.D.Pennsylvania, F.R.C.S.E.: outpatient M.O. at the Manchester Royal Eye Hospital.

MCELROY, J. R., M.B.Dubl.: R.S.O. at the Emergency Hospital Gosport.

MCMENEMEY, W. H., D.M.Oxfd, M.R.C.P., D.P.M.: pathologist to Worcester Royal Infirmary.

MARTIN, R. A., M.B.Manc.: res. asst. M.O. at Withington Hospital, Manchester.

MOUNSEY, J. M., M.B.Dubl.: temp. asst. school M.O. Northampton.

PHILLIPS, A. L., M.B.Camb.: senior R.M.O. at the Victoria Hospital for Children, Chelsea.

SPRINGFORD, W. E., M.B.Lond.: R.S.O. at the Kent and Sussex Hospital, Tunbridge Wells.

WILLIAMSON, H. C., M.B.Belf., D.P.H.: asst. M.O.H. for Oldbury.

Births, Marriages and Deaths

BIRTHS

DONALDSON CRAIG.—On Sept. 19, at Gerrard's Cross, the wife of Flying-Officer J. Donaldson Craig, M.B., R.A.F.V.R.—a daughter.

GREEN.—On Sept. 20, at Windsor, the wife of Mr. T. Anthony Green, F.R.C.S.—a son.

MARRIAGES

EXELL—PIÉJUS.—On Sept. 15, at Southgate, Clifford Exell, B.M., to Margaret Joan Piéjus.

HILL—RICHARDS-ORPEN.—On Aug. 31, at Killanne, Co. Wexford, Edward Parkinson Hill, M.D., A.M.S., to Charmain Dorcas Richards-Orpen.

JACOBS—MCCLEMENTS.—On Sept. 19, at Roslin, Midlothian, Joshua James Morris Jacobs, M.B., Major R.A.M.C., to Betty Parker McClements, M.B.

NOSWORTHY—BARRETT.—On Sept. 21, at Epsom, Michael Nosworthy, M.D., to Alison Barrett.

PAULI—O'DONOHOE.—On Sept. 16, at the Pro-Cathedral, Bristol, Churton Henry Pauli, M.R.C.S., Major R.A.M.C., to Monica O'Donohoe, M.B.

DEATHS

DODDS-PARKER.—On Sept. 22, A. P. Dodds-Parker, M.B.Oxfd, F.R.C.S., of 5, Canterbury Road, Oxford.

FENTON.—On Sept. 20, at Douglas, Isle of Man, Arthur Wellington Fenton, M.D.Dubl.

GROSVENOR.—Randolph Lea Grosvenor, M.R.C.S., killed, due to enemy action.

HARDWICKE.—On Sept. 16, at St. Mary's Hospital, Paddington, Edwin Cecil Hardwicke, M.B.Camb., late of Woolpit, Suffolk.

JAMIESON.—Alexander Jamieson, M.D. Aberd., killed as a result of an air-raid.

LENNON.—On Sept. 19, at Enfield, co. Meath, Edward Emanuel Lennon, F.R.C.P.I.

WALE.—On Sept. 24, George Wale, M.R.C.S., D.P.H., late of Croydon, aged 82.

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MONDAY, SEPTEMBER 30TH.		
10 a.m.	Ailments of the Soldier in Training.	
11.15 a.m.	Nutrition in the Wounded Soldier.	Dr. George Graham, M.D., F.R.C.P.
2 p.m.	War Injuries of the Nose, Throat, and Ear. I.	Mr. Lionel Colledge, F.R.C.S.
3 p.m.	War Injuries of the Nose, Throat, and Ear. II.	Mr. Lionel Colledge, F.R.C.S.
TUESDAY, OCTOBER 1ST.		
10 a.m.	Facial Injuries: Plastic Repair.	Mr. R. Mowlem, F.R.C.S.
11.15 a.m.	Facial Injuries: Plastic Restoration.	Mr. R. Mowlem, F.R.C.S.
1.15 p.m.	Bus to Royal College of Surgeons.	
2 p.m.	Demonstration of Specimens at the Royal College of Surgeons.	Mr. A. H. McIndoe, M.S., F.R.C.S.
WEDNESDAY, OCTOBER 2ND.		
10 a.m.	Skin Grafting	Mr. T. P. Kilner, F.R.C.S.
11.30 a.m.	Boils and other Infections.	
2 p.m.	Venereal Diseases in War. I.	Col. L. W. Harrison, D.S.O., F.R.C.P.
3 p.m.	Venereal Diseases in War. II.	Col. L. W. Harrison, D.S.O., F.R.C.P.
THURSDAY, OCTOBER 3RD.		
10 a.m.	Injury to the Facial Nerve	Mr. T. E. Cawthorne, F.R.C.S.
11.15 a.m.	Sprains, Strains, and Minor Fractures.	
2 p.m.	Preparation for Rehabilitation.	Dr. James Mennell, M.D.
3 p.m.	Co-operation of Surgeon with Dental Officer in the Early Treatment of Maxillo-Facial Injuries.	Lieut.-Colonel S. H. Woods, O.B.E.
FRIDAY, OCTOBER 4TH.		
10 a.m.	Venereal Diseases in War. III.	Col. L. W. Harrison, D.S.O., F.R.C.P.
11.15 a.m.	War Injuries of the Eye. I.	Mr. Charles Goulden, O.B.E., M.D., F.R.C.S.
2 p.m.	War Injuries of the Eye. II.	Mr. Charles Goulden, O.B.E., M.D., F.R.C.S.
3 p.m.	Demonstration of Plaster Technique.	Lieut.-Col. St. J. D. Buxton, F.R.C.S.

The fee for the Course will be One Guinea, but no fee will be charged in the case of officers of the Armed Forces and Emergency Medical Service who submit a leave certificate and register their names before the commencement of the course.

Applications for tickets should be addressed to the Dean, British Postgraduate Medical School, Ducane Road, W.12.

CHISWICK HOUSE,
PINNER, MIDDLESEX.
Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M.

ALCOHOLISM
Drug Habits, and Nervous Disorders

25 minutes from London, situated in charming grounds and country, is a "home from home" for those seeking rest and treatment under medical supervision. Fees from 6 guineas. Illustrated brochure on application to the matron.

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CHISLEHURST, KENT.

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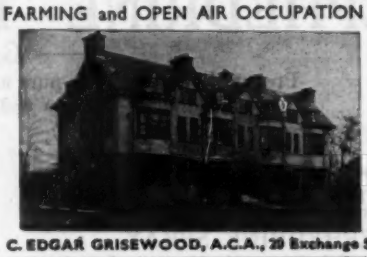
MAGHULL (Near Liverpool)

FARMING and OPEN AIR OCCUPATION for PATIENTS



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FEES:
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PRIVATE MENTAL HOME for Nervous and Mental Illness. All forms of treatment available. Fees from 4 gns. per week upwards, according to requirements. Vacancies occasionally exist at reduced fees on the recommendation of the patient's own physician.

Apply to Dr. J. A. SMALL. Telephone: Norwich 80

Telephone: WELbeck 2728 Telegrams: "ASSISTIAMO, LONDON"
For MEDICAL, SURGICAL, and
MENTAL NURSES
Male or Female
THE NURSES' ASSOCIATION
In conjunction with the MALE NURSES' ASSN.
29, YORK ST., BAKER ST., LONDON, W.1
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Also Fully Trained Nurses for
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MALE & FEMALE TRAINED THE TEMPERANCE NURSES CO-OPERATION
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all Cases, Male, Female, & Children
MATERNITY, FEVER, etc.
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'Grams: "ABSTAIN, LONDON"

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Special Nurses for Nerve and Mental Cases.

MALE and FEMALE

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Superior trained Nurses for Medical, Surgical, Mental Dipsomania, Travelling and all cases. Nurses reside on the premises and are always ready for urgent calls Day and Night. Skilled Masseuses, Masseurs, and good Valet attendants supplied. Terms from £3 13 6. Apply to the *Secretary or Lady Supt.*

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ST. ANDREW'S HOSPITAL

FOR NERVOUS AND MENTAL DISORDERS,

NORTHAMPTON

FOR THE UPPER AND MIDDLE CLASSES ONLY.

PRESIDENT: THE MOST HON. THE MARQUESS OF EXETER, K.G., C.M.G., A.D.C.

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., M.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, bio-chemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods: insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombieres treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-Ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for bio-chemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: No. 2356 and 2357 Northampton), who can be seen in London by appointment.

CHEADLE ROYAL HOSPITAL, Cheadle, Cheshire.

This REGISTERED HOSPITAL, with a SEASIDE BRANCH at Colwyn Bay, N. Wales, is for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL AND NERVOUS DISEASES.

The Hospital is governed by a COMMITTEE, appointed by the TRUSTEES of the Manchester Royal Infirmary.

In addition to the Main Buildings there are separate villas. Extensive grounds. Hard and grass tennis courts, cricket and croquet grounds, and a court for badminton. There are also wireless installations. Golf may be had within easy distance. Occupational Therapy.

VOLUNTARY, TEMPORARY, AND CERTIFIED PATIENTS received.

The Hospital is nine miles from Manchester, 50 minutes by rail from Liverpool, and 3½ hours from London.

For terms and further particulars apply to the Medical Superintendent, who may be seen in Manchester BY APPOINTMENT. *Telephone: Gatley* 2231 (3 lines).

CAMBERWELL HOUSE

Telegrams: "PSYCHOLIA, LONDON." 33, PECKHAM RD., LONDON, S.E.5. Telephone: Rodney 4242 (2 lines).

For the treatment of MENTAL DISORDERS.

Also completely detached Villas for Mild Cases, with private suites if desired. Voluntary Patients received. Twenty acres of Grounds. Hard and Grass Tennis Courts, Putting Greens, Bowls, Croquet, Squash Rackets, Recreation Hall with Badminton Court, and all indoor amusements, including Wireless and other Concerts, Occupational Therapy, Calisthenics, and Dancing Classes. X-ray and Actino-therapy, Prolonged Immersion Baths, Operating Theatre, Pathological Laboratory, Dental Surgery, and Ophthalmic Department. Chapel. **Shock and also modified insulin Therapy.**

Senior Physician: Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff, and visiting Consultants.

An Illustrated Prospectus, giving fees which are strictly moderate, may be obtained upon application to the Secretary.

The Convalescent Branch is Hove Villa, Brighton, and is 200 feet above sea level.

THE COTSWOLD SANATORIUM

First opened in 1898 and rebuilt in 1925 on the Cotswold Hills seven miles from Cheltenham, for the Treatment of Pulmonary and all other forms of Tuberculosis. Aspect S.S.W., sheltered from North and East, elevation 800 feet. Pure bracing air, SPECIAL TREATMENT by artificial PNEUMOTHORAX (X-ray controlled). TUBERCULINS, and ULTRA-VIOLET RAYS is available when necessary without extra charge. X-RAY plant, Fully Equipped Dental Department, Electric Light Radiators, hot and cold basins and Wireless in all rooms. Up-to-date drainage. Full day & night Nursing Staff. **Terms: £3 to £4 Guineas a week inclusive.**

Med. Supt.: GEOFFREY A. HOFFMAN, B.A., M.B., T.C. Dub. *Asst. Phys.:* MARGARET A. HARRISON, M.B., B.S. Lond. *Cons. Laryngologist:* G. N. BARKER, F.R.C.S. Edin., D.L.O. *Cons. Dent. Surgeon:* GEORGE V. SAUNDERS, L.D.S.R.C.S. Lond. *Phone:* 81 & 82 Witcombe. Apply: *The Secretary, The Cotswold Sanatorium, Cranham, Gloucester. Telegrams:* "Hoffman, Birdlip."

COURT HALL, KENTON, near EXETER

FOR THE TREATMENT OF EIGHT LADIES, VOLUNTARY, TEMPORARY AND CERTIFIED PATIENTS

CLIFFDEN, TEIGNMOUTH

FOR EARLY AND CONVALESCENT CASES Recreational Therapies are held daily by skilled Leaders

The house stands high with spacious balconies and extensive views of the South Devon Coast. Beautiful garden. Own Dairy in 25 acres. Private road to beach.

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR,** situated in 20 acres, 1100 ft. up for bracing moorland air.

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P.

Telephones—STARCROSS 259 and TEIGNMOUTH 289

HOLLOWAY SANATORIUM VIRGINIA WATER

A Registered Hospital for the Treatment of MENTAL DISORDERS of the EDUCATED CLASSES. Founded by THOMAS HOLLOWAY in 1885.

This Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Bedrooms and Special Nurses as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

There is a Branch Establishment at CANFORD CLIFFS, BOURNEMOUTH, where Patients can be sent for a change and be provided with all the comforts of a well-appointed home.

For Terms, apply to—

The RESIDENT MEDICAL SUPERINTENDENT, St. Ann's Heath, Virginia Water, SURREY

CRICHTON ROYAL, DUMFRIES

For NERVOUS AND MENTAL DISORDERS

Separate Villa for patients suffering from the effects of alcoholism and drug addiction. Every facility for complete investigation and individual treatment on the most modern lines. Fully equipped gymnasium, golf course, and indoor swimming pool. Specially trained occupational and recreational therapists. **Special Department for Insulin Therapy.** As the hospital is well endowed terms are exceptionally moderate, e.g., First Department from 3 guineas per week, Second Department, 2 and 2½ guineas per week. Voluntary and certified patients are received. Medical Certificates given anywhere in the British Isles are valid for admission of patients. *For prospectus, necessary forms, and further information apply to:—*

Physician Superintendent, **P. K. McCowan**, J.P., M.D., F.R.C.P., D.P.M., Barrister-at-Law. Tel. Dumfries 1119.

HAYDOCK LODGE,

NEWTON-LE-WILLOWS, LANCASHIRE.

For the reception and treatment of PRIVATE PATIENTS of both sexes of the UPPER AND MIDDLE CLASSES suffering from Mental and Nervous Disorders, Alcoholism and Drug addiction, either voluntarily, temporarily, or under certificate. Patients are classified in separate buildings according to their mental condition. Situated in park and grounds of 400 acres. Self-supported by its own farm and gardens in which patients are encouraged to occupy themselves. Every facility for indoor and outdoor recreation. For terms, prospectus, etc., apply MEDICAL SUPERINTENDENT. *Phone:* Ashton-in-Makerfield 7311. *Tele. Address:* Street, Ashton-in-Makerfield.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind. Terms moderate. Apply to Resident Medical Superintendent. Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

FENSTANTON, at "FIVE DIAMONDS," Chalfont St. Giles, Bucks.

A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders. Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground. (*See Medical Directory*, p. 2346.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

THE GROVE HOUSE, CHURCH STRETTON, SHROPSHIRE.

Private Home for Ladies mentally ill. Voluntary and Temporary Patients received.

Medical Superintendent: Dr. J. A. MCCLINTOCK.

BROOKE HOUSE, CLAPTON

A PRIVATE HOME for the treatment of Nervous and Mental Disorders in both sexes. Situated in nine acres of Pleasure Grounds.

Voluntary, Temporary, and Certified Patients received.

For further particulars apply—

Dr. ERNEST ROLLINS, Resident Physician.

Tel.: Amherst 1642.

VALE ROYAL ABBEY

The New CHESHIRE Home of MUNDESLEY SANATORIUM

This Modernised Mansion, situated in its own beautiful grounds in the heart of Cheshire, provides the serenity and modern facilities which are more than ever necessary for the proper treatment of tuberculosis in wartime. Terms from 6½ guineas weekly. Tel.: Winsford 3336.

Vale Royal Abbey, Winsford, Cheshire.

Medical and Surgical Staff:
S. VERE PEARSON, M.D. (Cantab.), M.R.C.P. (Lond.)
E. C. WYNNE-EDWARDS, M.B. (Cantab.), F.R.C.S. (Edin.)
GEORGE DAY, M.D. (Cantab.)

THE OLD MANOR SALISBURY

A Private Hospital for the Care and Treatment of those of both sexes suffering from MENTAL DISORDERS.

Extensive grounds. Detached Villas. Chapel. Garden and Dairy Produce from own farm. Terms very moderate.
CONVALESCENT HOME AT BOURNEMOUTH Detached Villas standing in 12 acres of ornamental grounds, with tennis courts, etc., which Voluntary, Temporary or Certified Patients may visit by arrangement for long or short period.
Illustrated Brochure on application to the Medical Superintendent. The Old Manor, Salisbury. Telephone: Salisbury 3216 and 3217.

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3½ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

RUTHIN CASTLE, NORTH WALES

A Private Clinic, the first in Great Britain, for investigation and treatment of all forms of disease, except infectious and mental

There is a steel and concrete Air Raid Shelter with heating and a lift to all floors

Inclusive charges Apply SECRETARY Telephone: Ruthin 66

VALE OF CLWYD SANATORIUM

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level, on the South West slopes of mountains rising to over 1800 feet, which protect it from north and east winds and provide many miles of graduated walks with magnificent views. Average rainfall 29·57 per annum. Full day and night Nursing Staffs. X-Ray plant. Every facility for Artificial Pneumothorax and for operations on the chest. Electric Lighting. Central Heating. Home Farm. Grade A Milk from T.T. Herd.

For particulars apply to Medical Superintendent.

H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales.

THE LAW NURSING HOME

ROCHDALE (Lancs)

Founder: The late SIR A. J. LAW, J.P., M.P.

A Private Hospital, exclusively for the treatment of POST-ENCEPHALITIC PARKINSONISM, PARKINSON'S DISEASE and ALLIED DISORDERS

The Nursing Home is governed by Trustees; any surplus is utilized to help patients who cannot afford full fees. Extensive grounds. Hydro. Expert Massage and Physical re-education. Dietary treatment. Equipped with every laboratory apparatus for the investigation and treatment of the diseases. Results of the BULGARIAN TREATMENT published (*Lancet*, 1939, 1, 693) approx.: 300 patients treated in the last 3 years. Terms moderate. Further particulars apply Medical Superintendent. Tel.: Rochdale 2960.

SPRINGFIELD HOUSE

'Phone: BEDFORD 3417. **Near BEDFORD**

For Mental Cases with or without Certificates.

Ordinary Terms: Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

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CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

STRETTON HOUSE,

Church Stretton, Shropshire.

ESTABLISHED IN 1853.

A PRIVATE HOME for the treatment of gentlemen suffering from Mental and Nervous illness, including the allied Disorders of Alcoholism and the Drug Habit. All types of early Mental and Nervous Cases are received without Certificates as Voluntary Patients under the provisions of the Mental Treatment Act, 1930. Bracing hill country. See "Medical Directory," p. 2358.—Apply to the Medical Superintendent. 'Phone 10 P.O., Church Stretton.

NORTHUMBERLAND HOUSE

GREEN LANES,

FINSBURY PARK, N.4

A PRIVATE HOSPITAL for the treatment of mental and nervous illnesses. Conveniently situated and easy of access from all parts. Occupational Therapy, Psychotherapy, and other modern forms of treatment. A.R.P. Shelters.

Telephone: Stamford Hill 2688.

For further particulars apply to the MEDICAL SUPERINTENDENT

WEIR COTTAGE

CHERTSEY, SURREY

Reception area London 20 miles Grounds of 10 acres

A Private Home for Patients receiving Psychotherapy or other special mental treatment. Inclusive fees from 10 guineas

Apply Dr. GLAISTER Tel.: Chertsey 2135 & Welbeck 0049

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HEATHERSIDE, CAMBERLEY, SURREY

FOR THE TREATMENT OF PULMONARY TUBERCULOSIS

Well situated on high ground and surrounded by pines and heather. All rooms are fitted with electric light, wash basins with hot and cold water, and radiators. X-ray plant. Day and night nursing staff.

RESIDENT MEDICAL SUPERINTENDENT: Dr. H. O. BLANFORD, to whom application for admission can be made.

THE COPPICE, NOTTINGHAM.

HOSPITAL FOR MENTAL DISEASES.

President: The Right Hon. LORD BELPER.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. Voluntary and Temporary Patients received. Occupational Therapy. For terms, &c., apply to the Medical Superintendent.

Telephone: 64117 Nottingham.

UNIVERSITY EXAMINATION POSTAL INSTITUTION

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Over 50 years' experience

POSTAL AND ORAL COACHING FOR ALL MEDICAL EXAMINATIONS

MEDICAL PROSPECTUS (36 pages), sent gratis, along with List of Tutors, &c., on application to the Principal, 17, Red Lion-square, London, W.C.1. (Telephone: HOLborn 6313.)

West London Hospital, Hammersmith, W.6.

APPOINTMENT OF A SECOND CASUALTY OFFICER (A).

Applications are invited from registered Medical Practitioners for the appointment of a Second Casualty Officer (A) now vacant, including R Practitioners within three months of qualification. The appointment will in the first instance be for a period of six months and may be terminated by a month's notice on either side, or, if held by an R Practitioner, for a period of six months. Salary is at the rate of £100 per annum, with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned forthwith.

H. A. MADGE, Secretary.

West London Hospital, Hammersmith, W.6.

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners for the appointment of a House Surgeon (A) to become vacant on 22nd October, including R Practitioners within six months of qualification. The appointment is for a period of six months and may be terminated by a month's notice on either side.

Salary £100 to £150 per annum, according to experience, with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 10th October. H. A. MADGE, Secretary.

Royal Free Hospital, Gray's Inn-road, W.C.1.

Applications are invited from Medical Women who have had recent previous V.D. experience for the part-time appointment of ASSISTANT MEDICAL OFFICER in the department for treatment of Venereal Diseases (female) vacant on 1st November and tenable for six months at a minimum salary of £300 per annum.

Intending candidates should submit applications, stating age and experience, with copies of three recent testimonials, to the undersigned on or before 5th October, 1940.

RICHARD T. BARTLEY, Secretary.

British Postgraduate Medical School. (UNIVERSITY OF LONDON.)

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of RESIDENT ANÆSTHETIST (B2), including R Practitioners who now hold A posts. The appointment is for a period of six months. Salary £150 per annum, with usual residential emoluments.

Applications, stating age, qualifications with dates, nationality, and previous experience, and accompanied by copies of three recent testimonials, should be sent to the Dean, British Postgraduate Medical School, Ducane-road, London, W.12, not later than October 9th, 1940.

Hampstead General Hospital, Haverstock-hill, N.W.3.

Applications are invited from single Medical Men, including R Practitioners who now hold A posts, for the post of HOUSE PHYSICIAN (B2) for six months, vacant 1st November next. Salary £133 6s. 8d. per annum.

Applications, on the prescribed form, with copies of three testimonials, to be returned by 21st October.

KENNETH A. F. MILES, Secretary.

King Edward Memorial Hospital, Mattock-lane, Ealing, W.13.

Applications are invited from registered Medical Practitioners (Male) for the appointment of a HOUSE PHYSICIAN (A) to become vacant in October, including R Practitioners within three months of qualification. The appointment will be for a period of six months. Salary at the rate of £150 per annum, with usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be sent to the undersigned as soon as possible.

R. A. MICKELWRIGHT, House Governor.

25th September, 1940.

Resident Junior Obstetric Officer

(Woman) required by MIDDLESEX COUNTY COUNCIL for MIDDLESEX COUNTY MATERNITY HOSPITAL, BUSHEY HEATH.

RESIDENT JUNIOR ASSISTANT MEDICAL OFFICER for Obstetric duties.

Must be registered Medical Practitioners with previous Obstetric experience. Salary £250 per annum, board, lodging and laundry.

Whole-time duties as County Council may direct under supervision of Medical Superintendent and Obstetric Surgeons of Redhill County Hospital under which Maternity Hospital is administered as an annexe. Appointment primarily for six months, subject to medical examination and one month's notice.

Applications, stating age, qualifications with dates, nationality, and present post, to the undersigned. No application forms provided.

Relationship to any member or officer of Council to be disclosed. Copies of not more than three recent testimonials. Canvassing directly or indirectly will disqualify. Closing date 12th October, 1940.

C. W. RADCLIFFE, "B3," Clerk of the County Council.

Guildhall, Westminster, S.W.1.

Middlesex County Council.

requires the following:—

(1) RESIDENT HOUSE OFFICER (Male) (A) for STAINES EMERGENCY HOSPITAL, London-road, ASHFORD. Must be registered Medical Practitioners, including R Practitioners within six months of qualification. Salary £120 per annum. Appointment for six months. Applications, stating age, nationality, qualifications with dates, and present post.

(2) RESIDENT ASSISTANT MEDICAL OFFICER (Male), (B1) for COUNTY SANATORIUM AND EMERGENCY HOSPITAL, HAREFIELD. Applications invited from registered Medical Practitioners, including suitably qualified R Practitioners holding B2 or B1 posts who have held house appointments. Experience in the modern treatment of Tuberculosis essential. Salary £400–£25–£475 per annum. Whole-time duties under supervision of Medical Superintendent. Appointment for four years only. Post now vacant.

(3) RESIDENT JUNIOR ASSISTANT MEDICAL OFFICER (B2) for REDHILL COUNTY HOSPITAL, EDGWARE. Must be registered Medical Practitioners, Male or Female, including R Practitioners who hold A posts and have not completed five months' tenure of those posts. Salary £250 per annum. Whole-time duties, mainly medical, under supervision of Medical Superintendent. For six months primarily, may be extended for further six months. Post now vacant.

(2) and (3) Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments.

All applications to the undersigned, subject to medical examination and one month's notice. Emoluments, board, lodging, and laundry. No application forms provided. Relationship to any member or officer of Council to be disclosed. Copies of not more than three recent testimonials to be enclosed. Closing date, 5th October, 1940.

C. W. RADCLIFFE, B3, Clerk of the County Council.

Guildhall, Westminster, S.W.1.

Coventry and Warwickshire Hospital. (452 Beds.)

FRACTURE AND ORTHOPÆDIC SERVICES.

Applications are invited for the post of RESIDENT REGISTRAR to the FRACTURE AND ORTHOPÆDIC DEPARTMENT (B1). Salary at the rate of £350 per annum, with full residential emoluments.

Candidates should hold the M.S. Degree of a university of the United Kingdom, or hold the Diploma of F.R.C.S., and must have had experience in modern methods of the treatment of fracture cases. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. The appointment is for twelve months in the first instance, and is renewable.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

S. CECIL HILL, House Governor and Secretary.

INDIAN MEDICAL SERVICE

RECRUITMENT OF EUROPEAN OFFICERS

Applications are invited from Medical Men for Emergency Commissions in the Indian Medical Service. Candidates will be interviewed by a Selection Committee at the India Office in October. Selected candidates will probably be required to sail for India in January and may be required to undergo a month's course of instruction in this country before departure.

British subjects of pure European descent who are under 32 years of age and who are registered under the Medical Acts in force in Great Britain and Northern Ireland are eligible to apply.

While no guarantee can be given of permanent retention in the I.M.S. after the war, Emergency Commissioned Officers will be considered for any vacancies that may then exist in the permanent cadre. Officers whose commissions are not extended will, on demobilisation, be granted gratuities based on one month's pay for each year of service.

RATES OF PAY.

Rank and Service in Rank.	Basic Pay in Rs. per mensem.	Year of Service.	Overseas Pay. £ per month.
Lieutenant	450	1	15
Captain, during 1st year as such	500	2	25
Captain, during 2nd and 3rd years as such	550	3	25
		4	25
Captain, during 4th and 5th years as such	600	5	25
		6	30

In addition to the above rates various allowances are admissible for a number of special appointments.

All commissioned service with the Colours as a Medical Officer will count as service towards rank and seniority. Antedates in respect of hospital appointments and higher medical qualifications will be granted only in the event of an officer receiving a permanent commission at the end of the war. On appointment officers will be granted a uniform allowance of £40.

DISABILITY AND FAMILY PENSIONS.

Officers will be eligible for the same Disability and Family Pensions as are admissible to Emergency Commissioned Officers of the British Service.

LEAVE AND PASSAGES.

Leave will be granted subject to the exigencies of the service under conditions applicable to Regular British Officers. On appointment an officer is provided with free passage to India and will be eligible for a return passage on the termination of his service. If he elects to remain in India, however, conveyance will be provided for his family, if any, to join him.

Application Forms and full particulars may be obtained from the UNDER-SECRETARY OF STATE, MILITARY DEPARTMENT, INDIA OFFICE, LONDON, S.W.1. Applications should reach the India Office as soon as possible and the envelope should be marked "Medical Recruitment" on the top left-hand corner.

County of Warwick.

STRATFORD-ON-AVON EMERGENCY HOSPITAL.

APPOINTMENT OF RESIDENT SURGICAL OFFICER (B1).

Applications are invited from registered Medical Practitioners for the appointment of Resident Surgical Officer. Applicants must have held house appointments and had previous surgical experience. Preference will be given to candidates holding the diploma of F.R.C.S. and suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary at the rate of £350 per annum.

APPOINTMENT OF HOUSE SURGEONS (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of House Surgeons at the above Hospital, including practitioners who have registered under the National Service (Armed Forces) Act, 1939, but who are within three months of qualification. All appointments will be limited in the first place to six months, but in the cases of practitioners who are not registered under the above Act will be renewable. Salary £200 per annum.

The appointments provide for full residential emoluments, but if this is not immediately practicable the authorised allowance at the rate of £100 per annum will be paid.

Applications, stating age, qualifications and dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the Public Assistance Officer, Shire Hall, Warwick.

L. EDGAR STEPHENS, Clerk of the Council.

Shire Hall, Warwick, 16th September, 1940.

City of Birmingham.

APPOINTMENT OF HOUSE SURGEONS (A).

Applications are invited from registered Medical Practitioners, Male or Female, for the appointment of House Surgeons (A posts) at the Birmingham Municipal general hospitals, including R Practitioners within three months of qualification.

The appointment will be for a period of six months. Salary is at the rate of £200 per annum, with full residential emoluments valued at £200 per annum.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the Medical Officer of Health, Council House, Birmingham, 3, on or before 10th October, 1940.

Salford Royal Hospital.

(256 Beds.)

The Board of Management invites applications for the temporary appointment of an HONORARY ASSISTANT PHYSICIAN.

Every candidate for the office of Honorary Assistant Physician must be a Graduate of a University requiring examination for its degrees, and a Fellow or Member of the Royal College of Physicians of London.

Candidates must be on the Medical Register and shall not practise Midwifery nor Pharmacy.

Applications, accompanied by certificates of age and of registration, and by not more than six testimonials, must be delivered to the undersigned on or before the 4th October next.

Details of duties may be had on application.

By Order of the Board,

H. B. SHELSWELL, General Superintendent and Secretary.

19th September, 1940.

County Borough of Walsall.

MANOR HOSPITAL.

JUNIOR ASSISTANT MEDICAL OFFICER (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the above appointment, including R Practitioners within three months of qualification. If held by an R Practitioner the appointment will be for a period of six months. Salary £150 per annum, together with the usual emoluments.

The person appointed will be required to act under the general direction of the Medical Superintendent and carry out the duties of Resident Anæsthetist and Casualty Officer and may be called upon to work in any other department of the Hospital.

Applications, stating age, professional qualifications, and experience, accompanied by not more than three copies of testimonials, should be sent to the Medical Officer of Health, Council House, Walsall, not later than 12th October, 1940.

26th September, 1940.

The Jessop Hospital for Women,

SHEFFIELD.

The Board of Management invite applications for the post of HOUSE SURGEON (Male or Female) (B2), commencing at once, including R Practitioners who hold A posts and who have not completed a five months' tenure of those posts. If held by an R Practitioner the appointment will be limited to six months.

Salary £100 per annum, together with board, residence, and laundry.

Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

DAVID OSWALD, Superintendent and Secretary.

Salford Royal Hospital.

(256 Beds.)

The Board of Management invites applications for the appointment of HONORARY PHYSICIAN.

Applications, accompanied by certificates of age and of registration, and by not more than six testimonials, must be delivered to the undersigned on or before 3rd October next.

The present Honorary Assistant Physician is an applicant for this vacancy.

By Order of the Board,

H. B. SHELSWELL, General Superintendent and Secretary.

19th September, 1940.

York Dispensary.

Applications are invited for the post of RESIDENT MEDICAL OFFICER (Female) to commence duties as soon as possible. The resident staff consists of two Medical Officers, whose duties are to visit and attend the sick poor in their own homes and to assist the honorary staff.

Candidates must be duly qualified, registered, and unmarried.

Experience in the administration of anæsthetics is essential.

Salary £220 per annum, with board, lodging, and attendance, with an allowance of £76 for car expenses, and for laundry.

Applications, with testimonials, to be sent on or before October 3rd to—

4, New-street, York. JOHN C. PETERS, Secretary.

City of Bradford Infectious Diseases HOSPITALS.

Applications are invited from registered Medical Practitioners, Male or Female, for the appointment of a HOUSE PHYSICIAN (A), including R Practitioners within three months of qualification. Salary is at the rate of £200 per annum, with full residential emoluments. If held by an R Practitioner the appointment will be for a period of six months.

Forms of application may be received from the Medical Officer of Health, Town Hall, Bradford, and should be returned not later than the 7th October, 1940.

N. L. FLEMING, Town Clerk.

Town Hall, Bradford.

Kent and Sussex Hospital, TUNBRIDGE WELLS.

APPOINTMENT OF CASUALTY OFFICER HOUSE SURGEON (B2).

Applications are invited from registered Medical Practitioners (Male) for the appointment of Casualty Officer House Surgeon (B2) to become vacant early October, including R Practitioners who now hold A posts. The appointment is for six months. The minimum salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned at the earliest possible moment.

TOM B. HARRISON, Superintendent-Secretary.

23rd September, 1940.

Royal Berkshire Hospital, Reading.

HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners (Male) for the appointment of House Surgeon, including R Practitioners within three months of qualification.

If held by an R Practitioner the appointment will be for a period of six months, otherwise it will be for a period of twelve months. Salary at the rate of £150 per annum, with full residential emoluments.

The person appointed will act as full-time assistant to the Pathologist, especially in connexion with Hæmatology and Blood Transfusions. Previous experience in Clinical Pathology is not necessary.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately.

H. E. RYAN, Secretary and House Governor.

Royal Sussex County Hospital, BRIGHTON. (380 Beds.)

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners, Male, for the appointment of a House Surgeon (A) to become vacant on 3rd November, 1940, including R Practitioners within three months of qualification. If held by an R Practitioner, appointment will be for a period of six months; otherwise it will be for a period of at least six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than the 12th October, 1940.

L. L. W. LANCASTER-GAYE, Secretary-Superintendent.

Oldham Royal Infirmary. (186 Beds.)

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of House Surgeon (A) vacant on the 5th October, including R Practitioners within six months of qualification. If held by an R Practitioner, appointment will be limited to six months; otherwise it will be for a period of six months.

Salary at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, to be forwarded to the undersigned not later than the 5th October.

F. W. BARNETT, General Superintendent and Secretary.

County Borough of Rochdale. MUNICIPAL GENERAL HOSPITAL—BIRCH HILL. (475 Beds.)

Applications are invited from registered Medical Practitioners (Male) for the post of JUNIOR RESIDENT MEDICAL OFFICER (A), including R Practitioners within three months of qualification. If held by R Practitioner appointment will be for a period of six months, and in any case will only be renewable for a further period of six months. The Hospital provides accommodation for Medical, Surgical, Maternity cases and children, and the appointment includes certain services at the adjoining Public Assistance Institution. Salary at the rate of £225 per annum, with full residential emoluments.

Application forms may be obtained from the Medical Officer of Health, Public Health Offices, Baillie-street, Rochdale, and must be returned to him not later than Friday, the 11th October.

23rd September, 1940. HARRY BANN, Town Clerk.

City of Liverpool. ALDER HEY EMERGENCY HOSPITAL.

APPOINTMENT OF RESIDENT ASSISTANT MEDICAL OFFICER (B2).

Applications are invited from registered Medical Practitioners (Male or Female), including R Practitioners who now hold A posts, for the appointment of Resident Assistant Medical Officer (B2) to the Children's Section at the above hospital.

Preference will be given to candidates with experience in children's diseases. If held by an R Practitioner the appointment will be limited to six months, otherwise it will be for a period of twelve months. The salary is at the rate of £200 per annum, with full residential allowances. All fees received in connexion with the appointment to be handed over to the City Council. The appointment will be made in accordance with the Standing Orders of the City Council and will be determinable by one month's notice on either side.

Applications, upon forms obtainable from the Medical Officer of Health, Hospitals Department, Gordon House, Belmont Grove, Liverpool, 6, to be endorsed "Resident Medical Officer" and returned to the undersigned so as to be received not later than 10 A.M. on Tuesday, 8th October, 1940.

W. H. BAINES, Town Clerk.

Municipal Buildings, Dale-street, Liverpool, 6, September, 1940.

Surrey County Council. TEMPORARY TUBERCULOSIS OFFICER.

Applications are invited for the post of Tuberculosis Officer. The post is temporary and will be, subject to satisfactorye service, for the duration of the War. The appointment will be subject to satisfactory Medical Examination.

The salary will be a fixed one on the scale of £750 to £950 per annum according to qualifications and experience.

Candidates must be registered Medical Practitioners and have held Resident appointment in a general Hospital for at least 6 months and have had special practical experience in the diagnosis and treatment of tuberculosis in Sanatoria or otherwise.

The Officer appointed will be required to devote his whole time to his official duties, to work under the administrative control of the County Medical Officer of Health, and to reside in such district as may be required. The duties will include the charge of Tuberculosis dispensaries, the general arrangements for the treatment of tuberculosis patients otherwise than in Sanatoria, and such other duties as the Council may direct.

The appointment is terminable by one month's notice on either side.

Applications, stating age, qualifications and experience, together with copies of not more than three recent testimonials, must be sent to the County Medical Officer of Health, County Hall, Kingston-upon-Thames, from whom further particulars may be obtained.

Special forms of application are not supplied. Envelopes must be endorsed "Tuberculosis Officer."

Canvassing directly or indirectly will be a disqualification.

The last date for receipt of applications is first post on Saturday, October 12th, 1940.

DUDLEY AUKLAND, Clerk of the Council.

County Hall, Kingston-upon-Thames, 27th September, 1940.

Surrey County Council. PUBLIC HEALTH DEPARTMENT.

SURREY COUNTY SANATORIUM, MILFORD, near GODALMING. (348 Beds.)

JUNIOR ASSISTANT RESIDENT MEDICAL OFFICER (B2) (Male or Female).

Applications are invited for the above appointment which will be available for a period of six months, renewable for a further six months (R Practitioners who hold A appointment may apply, but if appointed the term of appointment is limited to six months). The salary will be at the rate of £250 per annum, together with full residential emoluments valued at £100 per annum. Applicants should have held a house appointment in a general hospital.

Applications, stating nationality, age, qualifications, and experience, and enclosing copies of not more than three recent testimonials, should be sent to the Medical Superintendent, Surrey County Sanatorium, Milford, near Godalming, Surrey, so as to reach him not later than 4th October, 1940.

DUDLEY AUKLAND, Clerk of the Council.

County Hall, Kingston-upon-Thames, 27th September, 1940.

Manchester Northern Hospital. (General Hospital. 113 Beds.) Cheetham Hill-road, MANCHESTER, 8.

APPOINTMENT OF RESIDENT SURGICAL OFFICER (B1).

Applications are invited from registered Medical Practitioners for the appointment of Resident Surgical Officer to become vacant on or before 1st November, 1940. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding Diploma of F.R.C.S. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £200 per annum, with board and residence.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials should be sent to Mr. JAMES C. DANIELS, Secretary, 38, Barton Arcade, Manchester 3, immediately.

Stockport Infirmary.

(159 Beds—5 Residents.)

Applications are invited from registered Medical Practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1) to become vacant on 25th October. Applicants should have held house appointments and had surgical experience. Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £250, with full residential emoluments.

Applications, stating age, nationality, qualifications, and experience, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 2nd October. H. G. PRICE, Secretary-Superintendent.

Royal Victoria and West Hants

HOSPITAL, BOURNEMOUTH.

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from registered Medical Practitioners (Male) for the appointment of a House Surgeon (A), including R Practitioners within three months qualification. If held by an R Practitioner appointment will be for a period of six months. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualification with date, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned immediately. The appointment is recognised for the S.R.C.S. Examination.

GORDON M. SAUL, Secretary.

The Royal Albert Institution for the

FEEBLE-MINDED, LANCASTER.

Applications are invited from registered Medical Practitioners for the appointment of RESIDENT JUNIOR MEDICAL OFFICER, Male (B1), unmarried, temporary or permanent. Applicants should have a Dental Diploma. Knowledge of refraction work an advantage. Ample opportunity for research. To take up duties at the end of October.

Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply.

Salary commences at £425 per annum, with full board, lodging, etc.

Applications, accompanied by copies of three recent testimonials and with two personal references, to be made to the Medical Superintendent.

Grimsby and District Hospital.

RESIDENT ANÆSTHETIST (B2).

Applications are invited from registered Medical Practitioners for the above appointment, including R Practitioners who hold A posts. Salary is £200 per annum.

Applications, stating age, qualifications, with dates and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

H. B. COATES, Secretary-Superintendent.

23rd September, 1940.

Addenbrooke's Hospital, Cambridge.

APPOINTMENT OF HOUSE PHYSICIAN (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of House Physician (A) to become vacant on November 1st, 1940, including R Practitioners within three months of qualification. The appointment will be for a period of six months, but is terminable at an earlier date by one month's written notice on either side. Salary is at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Thursday, October 3rd, 1940.

J. A. BEARDSALL, Secretary-Superintendent.

Addenbrooke's Hospital, Cambridge.

APPOINTMENT OF RESIDENT ANÆSTHETIST AND EMERGENCY OFFICER (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of Resident Anæsthetist and Emergency Officer (A) to become vacant on October 9th, 1940, including R Practitioners within three months of qualification. The appointment will be for a period of three months. Salary is at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Thursday, October 3rd, 1940.

J. A. BEARDSALL, Secretary-Superintendent.

Addenbrooke's Hospital, Cambridge.

Appointment of HOUSE OFFICERS to staff additional beds in Annexes (A).

Applications are invited from registered Medical Practitioners, Male and Female, including R Practitioners within three months of qualification, for appointments at the annexes which are being established at this Hospital. The appointments will be for periods of six months, but are terminable at an earlier date by one month's written notice on either side. Salary is at the rate of £130 per annum, with full residential emoluments.

Particulars of the posts may be had on application to the undersigned. J. A. BEARDSALL, Secretary-Superintendent.

Addenbrooke's Hospital, Cambridge.

APPOINTMENT OF CASUALTY OFFICER AND SUPERNUMERARY HOUSE OFFICER (A).

Applications are invited from registered Medical Practitioners, Male and Female, for the appointment of Casualty Officer and Supernumerary House Officer (A) to become vacant on October 9th, 1940, including R Practitioners within three months of qualification. The appointment will be for a period of six months, but is terminable at an earlier date by one month's written notice on either side. Salary is at the rate of £130 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than Thursday, October 3rd, 1940.

J. A. BEARDSALL, Secretary-Superintendent.

Rotherham and District General

HOSPITAL.

(140 Ordinary and 70 War Emergency Beds.)

CASUALTY OFFICER (A).

Applications are invited from registered Medical Practitioners (Male) for the above appointment to become vacant on the 1st October, including R Practitioners within three months of qualification. If held by an R Practitioner the appointment will be for a period of six months. Salary £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned forthwith.

T. H. FLETCHER, Secretary-Superintendent.

Rotherham Hospital, Doncaster Gate, Rotherham, Yorks.

Manchester Ear Hospital,

Grosvenor-square, ALL SAINTS'. (30 Beds.)

Applications are invited from registered Medical Practitioners, Male and Female, including R Practitioners within three months of qualification, for the appointments of RESIDENT and NON-RESIDENT HOUSE SURGEONS (A) at once. Salaries at the rate of—Resident House Surgeon £120 per annum, with full residential emoluments; Non-resident House Surgeon £150 per annum, with partial board. In the case of R Practitioners, appointment will be for a period of six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to Mr. REGINALD S. MILFORD, Hon. Secretary, Manchester Ear Hospital, c/o Mr. W. J. Elliam, 17, Brazennose-street, Manchester, 2.

County Borough of Burnley.

ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from registered Medical Practitioners of either sex for the above position.

The duties will be mainly in connexion with the School Medical Service, but frequently include Maternity and Infectious Diseases.

Salary £500, rising by £25 per annum to a maximum of £700 per annum.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Conditions of appointment and forms of application may be obtained from the Medical Officer of Health, 27, St. James'-street, Burnley, to whom applications should be returned not later than 5th October, 1940.

ARCHIBALD GLEN, Town Clerk.

Town Hall, Burnley, 12th September, 1940.

The Chester Royal Infirmary.

(Normal Capacity 225 Beds.)

Applications are invited from registered Medical Practitioners for the appointment of RESIDENT ORTHOPÆDIC OFFICER (B1) to become vacant on the 1st October, 1940.

Applicants should have held house appointments, and had Orthopædic experience.

Suitably qualified R Practitioners holding B2 or B1 appointments are invited to apply. The salary is at the rate of £250 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by three recent testimonials, should be sent to the undersigned not later than the 3rd October.

W. H. GRACE, Hon. Secretary, Medical Committee.

County Borough of Reading.

BATTLE HOSPITAL.

(300 E.M.S. beds; 290 others.)

Applications are invited from registered Medical Practitioners for the post of RESIDENT ASSISTANT MEDICAL OFFICER (B1 Surgical). Preference will be given to a Fellow of the Royal College of Surgeons. Suitably qualified R Practitioners holding B1 or B2 appointments are invited to apply.

The salary offered is £400 per annum, plus residential emoluments for a single man.

Application forms can be obtained from the undersigned and are returnable not later than the 12th October, 1940.

C. S. JOHNSON, Town Clerk.

Town Hall, Reading, 24th September, 1940.

County Council of Durham.

ASSISTANT WELFARE MEDICAL OFFICER.

The County Health Committee invite applications for an Assistant Welfare Medical Officer (Woman) at a commencing salary of £600 per annum, rising by annual increments of £25 to £700 per annum. Travelling allowance will be paid by the County Council in accordance with a scale to be approved from time to time.

The appointment will be subject to the regulations for the time being of the County Council relative to the payment of salary in the case of sickness, and will be terminable by three months' notice on either side. The appointment will be also subject to the following conditions:—

(1) The officer appointed must be a registered Medical Practitioner between the ages of twenty-five and fifty-five years; must devote the whole of her time to the duties of the office; and must not engage in private practice.
(2) She should either have had a previous appointment as Medical Officer of an antenatal clinic, with the approval of the Minister of Health, or have had at least three years' experience in the practice of her profession and special experience of practical midwifery and antenatal work. The holding of a Diploma in Public Health will be deemed an additional qualification for the post.
(3) She will be subject to the directions of the County Medical Officer of Health.
(4) She will be required to reside in Durham City, or such other place as required by the Council.
(5) She must be prepared to undertake any duties in connexion with the Maternity and Child Welfare Services of the County Council, including attendance at Birth Control Clinics.
(6) She must be prepared, if called upon, to act as locum tenens to other members of the medical staff of the County Medical Officer of Health.
(7) The appointment will terminate on marriage.
(8) The candidate will be required to pass the County Council's medical examination, and will be subject to the provisions of the Local Government Superannuation Act, 1937.

Applications, endorsed "Assistant Welfare Medical Officer," with copies of not more than three recent testimonials, must be addressed to the County Medical Officer of Health, Shire Hall, Durham, and must be received by him not later than Saturday, 5th October, 1940.

J. K. HOPE, Clerk of the County Council.

Shire Hall, Durham, 9th September, 1940.

City of Portsmouth.

RESIDENT MEDICAL OFFICER AT THE INFECTIOUS DISEASES HOSPITAL (291 Beds) AND ASSISTANT MEDICAL OFFICER OF HEALTH.

Applications are invited from unmarried Medical Practitioners (Male) who have had experience of infectious diseases and possess the Diploma in Public Health for the above appointment. Salary £500–£700, rising by annual increments of £25, inclusive of residential emoluments which are valued at £125.

The gentleman appointed will be required to devote his whole time to the office, which will also include duties in connexion with the work of the Public Health Department as assigned to him by the Medical Officer of Health.

The position is subject to the provisions of the Local Government Superannuation Act, 1937, and the successful applicant will be required to pass a medical examination.

Application forms may be obtained from, and must be returned to, the Acting Medical Officer of Health, Northern Secondary School, Portsmouth, not later than Friday, 4th October, 1940.

Canvassing will be a disqualification.

F. J. SPARKS, Town Clerk.

The Guildhall, Portsmouth, 7th September, 1940.

Macclesfield West Park (County) HOSPITAL.

APPOINTMENT OF A HOUSE SURGEON (A).

Applications are invited from Male registered Medical Practitioners for the appointment of a House Surgeon (A) to become vacant on 1st October, 1940, including R Practitioners within three months of qualification. If held by an R Practitioner, appointment will be for a period of six months. Otherwise it will be for a period of twelve months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than 5th October.

IAN MACKAY, County Medical Officer of Health.

24, Nicholas-street, Chester.

Borough of Todmorden.

MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER.

Applications are invited for the position of whole-time Medical Officer of Health, School Medical Officer, and Superintendent of Infectious Diseases Hospital. Salary £800 per annum and motor-car allowance of £80 per annum. The appointment is subject to the Local Government Superannuation Act, 1937.

Applications, stating age, qualifications, and experience, with copies of not more than three recent testimonials, to reach me on or before Saturday, 12th October, 1940, in envelopes endorsed "Medical Officer."

HERBT. GARRATT, Town Clerk.

Municipal Offices, Todmorden.

Norfolk & Norwich Hospital, Norwich.

(448 Beds.)

Applications are invited from registered Medical Practitioners for the appointment of DEPUTY CASUALTY OFFICER (A) with charge of beds in the SPECIAL DEPARTMENTS (Ear, Nose, and Throat and Ophthalmic), including R Practitioners within six months of qualification. If held by an R Practitioner, appointment will be limited to six months. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned as soon as possible.

FRANK INCH, House Governor and Secretary.

20th September, 1940.

County Borough of Reading.

BATTLE HOSPITAL.
(300 E.M.S. Beds; 290 others.)

Applications are invited from registered Medical Practitioners (Male), for the post of RESIDENT ASSISTANT MEDICAL OFFICER (B2), for general duties with emphasis upon anæsthetics.

R Practitioners holding A posts are invited to apply, and the appointment will be limited to six months with possible renewal.

Salary will be at the rate of £300 per annum, plus residential emoluments for a single man.

Application forms can be obtained from the undersigned and are returnable not later than the 12th October, 1940.

C. S. JOHNSON, Town Clerk.

Town Hall, Reading, 24th September, 1940.

Cheshire County Council.

CLATTERBRIDGE (COUNTY) GENERAL HOSPITAL
(Nr. Birkenhead).

JUNIOR RESIDENT ASSISTANT MEDICAL OFFICER (MALE) (A).

Applications are invited from Registered Medical Practitioners (Male), including R Practitioners within three months of qualification, for the above appointment at a salary of £250 per annum, together with the usual residential allowances.

If held by an R Practitioner appointment will be for a period of six months, otherwise it may be renewed for a further period of six months.

There is a Non-Resident Medical Superintendent, a Resident Deputy Medical Superintendent, and a Consulting Staff from Teaching Hospitals.

Applications to be made on forms obtainable from the undersigned and returned not later than the 10th October, 1940.

IAN MACKAY, County Medical Officer of Health.

County Public Health Department, 24, Nicholas St., Chester.

City of Portsmouth.

SAINT MARY'S HOSPITAL. (1275 Beds.)

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The above appointment is subject to the provisions of the Local Government Superannuation Act, 1937.

Application forms may be obtained from, and must be returned to, the Acting Medical Officer of Health, Northern Secondary School, Portsmouth, forthwith.

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F. J. SPARKS, Town Clerk.

The Guildhall, Portsmouth, 11th September, 1940.

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The Royal Infirmary, Sunderland.

Applications are invited from Male registered Medical Practitioners for the appointment of HOUSE SURGEON (A) to become vacant on the 1st October, 1940.

The appointment will be limited to six months.

The salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the undersigned at the earliest possible date.

M. J. HUNTLEY, House Governor and Secretary.

Royal Hospital, Richmond, Surrey.

APPOINTMENT OF HOUSE SURGEON (A).

Applications are invited from Medical Practitioners (Male) for the appointment of House Surgeon (A) to become vacant on the 24th October, 1940. Salary is at the rate of £100 per annum with full residential emoluments.

Application papers can be obtained from the undersigned and should be returned not later than the 4th October.

M. E. WRIGHT, Acting Secretary-Superintendent.

The Children's Hospital, Sheffield.

(157 Beds.)

Applications are invited from registered Medical Practitioners Male and Female, for the appointment of a HOUSEPHYSICIAN, (A) to become vacant on 24th October, 1940, including R Practitioners within three months of qualification. Appointment is for a period of six months. Salary at the rate of £100 per annum, with full residential emoluments.

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